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MATERNAL PREDICTORS OF CHILDREN'S FACIAL EMOTIONS IN MOTHER-CHILD INTERACTIONS

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by

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Dedicated to my family,

Steve and Jocelyn Renee

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This study examined maternal predictors of children's facial expressions of emotion in mother-child interactions. Ninety-four mothers and their 14- to 27-month old toddlers were observed during a 20-minute interaction. Results demonstrated that two different components of maternal sensitivity, supportive behavior and child-oriented motivation, predicted more facial expressions of joy and sadness and less flat affect in children. Maternal autonomy granting, a third component of maternal sensitivity, predicted more facial expressions of anger in children. This study also examined relations between macrosocial variables (i.e., maternal well-being and demographic factors) and children's facial expressions of emotion and how maternal sensitivity mediated such relations. High maternal education was directly related to fewer facial expressions of sadness and anger, high SES was related to more facial expressions of joy, and both greater marital satisfaction and social support were related to more facial expressions of anger. It was also shown that supportive behavior mediated associations between: maternal depressive symptoms and both low joy and high flat affect, marital satisfaction and low flat affect, maternal education and high joy, and family income and high joy. Child-oriented motivation mediated associations between maternal depressive symptoms and both high flat affect and low sadness. Findings suggest that it is important to consider multiple measures of maternal sensitivity and the broader macrosocial context in which the parent-child relationship is embedded when examining children's facial expressions of emotion in mother-child interactions.

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Introduction

Before parents and children use language to communicate, they communicate through emotional exchanges. Caregivers spend a great deal of time interacting with young children, and this interaction involves the experience and expression of emotions (Montague & Walker-Andrews, 2001). Scholars explain that, "Whereas emotions were once viewed as unimportant outcomes of 'cold' cognitive processes, lacking adaptive value at best or constituting maladaptive functioning at worst. . . It is now clear that emotions are useful as organizational constructs. . ." (Campos & Barrett, 1988, p. 256). Children's emotions are fundamentally important components of mother-child interactions and serve as windows onto children's evaluations of interactions with their mothers. Thus, researchers need to understand the reasons why they occur.

Human behavior is initiated and motivated by individuals' desires to satisfy their concerns and objectives (Abe & Izard, 1999; Dix & Branca, 2003; Lazarus, 1991). Goal-oriented emotion theory has emphasized that individuals express emotion in order to accomplish goals and meet needs. Behavior is initiated and motivated by individuals' "desire to satisfy basic drives or promote other concerns and objectives" (Dix & Branca, 2003, p. 167). Children's emotional expressions signal to mothers whether children are accomplishing their goals within interactions. Children's emotional cues give feedback to mothers that may result in her becoming either more sensitive or less sensitive. Negative child emotions may indicate that mothers need to change their behavior to better address the child's goals and needs, while positive emotions may indicate that mothers should continue their current behavior. Thus, children may predictably express positive emotion if their mothers behave sensitively, addressing their children's goals and needs, or children may predictably express negative emotion if their mothers do not behave sensitively, failing to address their children's goals and needs.

Miller, McDonough, Rosenblum, and Sameroff (2002) point out that children's ability to regulate emotional expression is established within the primary caregiving relationship, allowing parent-child dyads to develop distinctive reciprocal or regulatory patterns through thousands of interactions over the course of development (Calkins,

1994; Kopp, 1989). Because external support and emotional reciprocity from caregivers is essential for young children's emotion regulation (Kopp, 1989), most models of emotion in parent-child interactions consider how parents operate as external regulators for their children's emotions (Thompson, 1994). Researchers have emphasized that in affectively well-regulated, reciprocal interactions, mothers and young children are affectively attuned to each other and experience mutually positive affect (e.g., joy) (Field, 1985; Tronick & Gianino, 1986; Stern, 1985). Thus, from a reciprocal interaction perspective, affective coordination in well-regulated, reciprocal interactions may maintain children's positive emotions, while miscoordination or lack of emotional reciprocity may increase children's negativity or lack of emotional communication overtime.

Children's emotional expressions are correlates of developmental outcomes and may reveal how children are functioning and developing over time. Thus, an important determinant of interactions that affect developmental outcomes may be children's emotional expressions during early interactions with their mothers. For example, emotionally positive parent-child interactions are associated with desirable child outcomes including socio-emotional competence, positive behavior adjustment, and attachment security, while emotionally negative parent-child interactions are related to an assortment of less optimal outcomes, including behavioral difficulties and poorer social adjustment (see Martin, Clements, & Crnic, 2002). Examining children's facial emotions in mother-child interactions may help researchers understand underlying perturbations in these relationships that lead to undesirable child outcomes.

When examining children's emotional expressions with their mothers, it is important to consider the broader environmental or macrosocial context in which the parent-child relationship is embedded. Macrosocial factors of interest in this study include maternal protective or risk factors related to support and stress. Specifically, macrosocial factors examined here are variables that tend either to bolster (e.g., maternal well-being, and positive demographic factors) or reduce parental competence (e.g., lack of maternal well-being, and negative demographic factors). Such factors may

lead to predictable changes in children's emotional expression because they may either foster or undermine maternal sensitivity. Furthermore, although macrosocial protective or risk factors are associated with positive or negative child developmental outcomes respectively, the mircrosocial processes that explain why this is the case are poorly inderstood. One such microsocial process may be that children's emotions are affected by macrosocial variables via maternal sensitivity in mother-child interactions. For the most part, studies on predictors of children's facial emotions have not analyzed the impact of macrosocial variables on children's emotional expressions. Studies that have included macrosocial variables tend to analyze child development outcomes, not children's affective displays. Furthermore, such studies analyze how macrosocial variables directly affect children's development without testing whether parental behavior (e.g., maternal sensitivity) mediated the relations between macrosocial variables and children's developmental outcomes. Studies have yet to examine how macrosocial variables affect children's facial emotions, microsocial indicators of children's development, and how maternal sensitivity might mediate these relations.

The aim of this study is to determine maternal predictors of young children's facial expressions of emotion in mother-child interactions. The first objective is to examine the direct relations between maternal sensitivity and children's expressions of emotions. This study attempts not only to replicate findings on the relations between one measure of maternal sensitivity and children's emotions, but also to pioneer an examination of the associations between two new measures of maternal sensitivity and child emotions. That is, earlier data on the relations of maternal sensitivity and child emotions has examined measures of sensitive, responsive maternal behavior as predictors of child emotions. However, to my knowledge, this study is the first to examine the relations of both maternal child-oriented motivation and maternal autonomy granting behavior to child emotions.

In addition to the relations between maternal sensitivity and children's facial emotions, this study aims to examine the relations between macrosocial maternal factors and children's facial emotions. I expect children's emotions to be related to these

macrosocial factors through their association with components of maternal sensitivity. That is, maternal sensitivity may function as a mediator of the relations between macrosocial maternal factors and children's facial emotions. For example, factors that reduce parental competence (e.g., depressive symptoms, low socioeconomic status) may lead to less positive and more negative facial emotion in children because they undermine maternal sensitivity. Thus, the second objective of this study is to examine the direct relations between maternal psychological well-being factors and children's expression of emotions in mother-child interactions and to determine whether maternal sensitivity mediates these relationships. The third objective of this study is to examine the direct relations between family demographic factors and children's expressions of emotions in mother-child interactions and to determine whether maternal sensitivity mediates these associations. Overall, I consider multiple measures of maternal sensitivity and the broader environmental or macrosocial context in which the parent-child relationship is embedded when examining children's emotional expressions when interacting with their mothers.

Maternal Sensitivity Relations to Children's Emotions

The first objective of this study is to examine the direct relations between maternal sensitivity and children's expressions of emotions in mother-child interactions. This study defines the construct of maternal sensitivity with three key measures: maternal supportive behavior, child-oriented motivation, and maternal autonomy granting.

Maternal Supportive Behavior

Maternal support for children's wants and intentions is an important component of maternal sensitivity that may predict children's facial emotions. Maternal supportive behavior tailors children's immediate surroundings to help them achieve their goals (Dix, Gershoff, Meunier, & Miller, 2004). Researchers generally characterize as supportive or sensitive, behavior that is responsive, unintrusive, and emotionally available. Findings from studies of mother-infant play interaction have shown that infant responsiveness and emotional expressions are related to their mother's responsive

behavior (Brazelton, Koslowski, & Main, 1974; Stern, 1977). Specifically, maternal sensitivity is associated with high levels of infant positive emotion (Kivijaervi, Voeten, Niemelae, Raeihae, Lertola, & Piha, 2001; Seifer, Schiller, Sameroff, Resnick, & Riordan, 1996) and low levels of infant negative affect (Braungart-Rieker, Garwood, Powers, & Wang, 2001), while maternal insensitivity is associated with more negative and less positive infant emotion (Bridges, Grolnick, & Connell, 1997).

Some of the most notable evidence of child emotions that occur with maternal sensitive responsiveness is demonstrated in still-face research. The still-face procedure (Tronick, Als, Adamson, Wise, & Brazelton, 1978) has been used to evaluate infant sensitivity to changes in maternal behavior and is a useful tool for analyzing how maternal nonresponsiveness or insensitivity impacts children's emotional expression in mother-child interactions. The still-face procedure is composed of three brief stages. In the first stage, the mother and infant engage in contingent, usually playful interaction. In the second stage, the still-face episode, the mother poses a neutral, non-responsive still-face for one to two minutes. In the third stage, the reunion episode, the mother becomes contingent again. Infants characteristically express emotions in response to maternal behavior in each episode. During the normal, contingent interaction episodes, infants often gaze and smile (about 70% and 20% of the time, respectively) at their mother (D'Entremont & Muir, 1997) and express relatively high levels of positive and low levels of negative affect (Weinberg & Tronick, 1996). In the still-face episode, the infants gaze at mothers about 50% less and stop smiling (Gusella, Muir, & Tronick, 1988). They also express decreased positive affect and increased negative affect (Weinberg & Tronick, 1996). In the reunion episode, children express both positive and negative affect. Negative affect during the reunion episode presumably indicates a carryover of negative affect from the still-face to the reunion episode. This implies that infants' negative states are not easily mollified when mothers resume interaction.

However, still-face studies have also shown that children of unresponsive mothers demonstrate more flat affect overall when interacting with their mothers. For example, typical still-face studies have shown that infants express decreased positive

affect and increased negative affect (Weinberg & Tronick, 1996), gaze less at their mothers, and stop smiling (Gusella et al., 1988). However, in still-face studies of children of depressed mothers, children demonstrate less positive emotions during the initial stage of the interaction and show little change during the still-face or "depressed" stage of the interaction, expressing more flat affect overall (Field, 1984). Unlike still-face studies with nondepressed mothers, these children do not act distressed when their mothers are instructed to behave unresponsively. They may have learned to expect insensitive maternal behavior and may be accustomed to their mothers' insensitive style. Although children typically possess goals for sensitive, reciprocal interaction, children of depressed mothers may fail to possess such goals because they have come to expect nonresponsive, insensitive maternal behavior. Therefore, children of depressive mothers are less likely to become upset and more likely to demonstrate flat affect in response to maternal insensitivity. Becoming emotionally non-communicative and flat in such interactions may demonstrate a form of learned helplessness because their emotional expressions do not elicit sensitive maternal responses (Nolen-Hoeksema, Girgus, & Seligman, 1986; Peterson & Seligman, 1983; Seligman, 1975). It is important to consider that, on a broader level, macrosocial risk factors might lower parenting competence and increase mothers' propensity for insensitive parenting, leading to children's flat affect due to unresponsive, insensitive maternal behavior.

Because maternal responsive, supportive behavior tailors children's environments to help them achieve their needs and wants, children may express more positive emotion (i.e., joy), less negative emotion (i.e., anger and sadness), and less flat affect with mothers who are responsive and supportive. Prior research has utilized forms of supportive or responsive maternal behavior to predict child emotions, but the following components of maternal sensitivity are, to my knowledge, untapped in literature on predictors of children's facial emotions. Including these new measures of maternal sensitivity goes beyond analyzing maternal sensitive behavior in play interactions and considers both mothers' internal motivational states (i.e., child-oriented

motivation) and their sensitive behavior in potentially emotionally challenging control situations (i.e., maternal autonomy granting).

Child-Oriented Motivation

Mothers' child-oriented motivation is an important component of maternal sensitivity that may predict children's facial emotions. Child-oriented motivation represents an internal variable that measures mothers' ongoing affective concern for their children and their motivation to promote their children's interests rather than their own (Dix, 1992). Mothers' behavior might not always correlate with her motivations. That is, child-oriented mothers may have different ideas on how to actualize their motivations, which may manifest in different ways. Measuring mothers' child-oriented motivation might capture a different dimension of maternal sensitivity than measuring mothers' behavior. Thus, it is of interest to determine whether mothers' child-oriented motivation predicts children's emotional expressions like measures of observed maternal sensitive behavior.

Researchers have proposed that sensitive parenting, and supportive parenting in particular, may depend on child-oriented concerns or motivation. When parents fail to give children's interests priority, the appraisals, emotions, intentions, and behavioral preparations that motivate sensitive parenting may fail to occur (Dix, 1992). The result may be insensitive parenting. Child-oriented parents tend to seek outcomes that their children also seek, fostering cooperation. This should increase the probability of positive emotions in children. Conversely, parent-oriented parents often seek outcomes that their children do not want, resulting in incompatible parent and child goals. In turn, children often behave with opposition, blocking parents' goals, and leading to negative emotions in parents (Dix et al., 2004; Dix & Branca, 2003; Maccoby & Martin, 1983) and likely in children as well. Sensitive parenting is based in part on parents activating child-oriented concerns (Dix, 1992). These child-oriented or empathetic concerns may result in children's expression of more positive emotion (i.e., joy), less negative emotion (i.e., anger and sadness), and less flat affect.

Maternal Autonomy Granting

Mothers' autonomy granting strategies, another key component of maternal sensitivity, may predict children's facial emotions. Examining maternal sensitivity during control situations is of interest because control situations may be emotionally charging for children and may have a lasting impact on children's emotional expressions. A great deal of emotion socialization may take place during situations involving maternal control. For example, there may be a number of instances during control situations where mothers aim to extinguish or punish the expressions of certain emotions, if undesirable, leading to fewer expressions of such emotions overall in children. Autonomy granting mothers may promote positive expressions of emotion in children overtime. Thus, children's tendency to express emotions might be related to these control interactions.

When parents want children to comply with their wishes, often this means influencing children's motivation so that parent and child goals become compatible. Strategies for eliciting compatible child behavior include: autonomy granting (i.e., adjusting and integrating parent and child wants), forcing (i.e., demanding child compliance to parents' wants), and yielding (i.e., giving way to children's wants) (Dix & Branca, 2003). Autonomy granting mothers consider children's needs or interests during attempts to influence children's motivation so that children are more likely to comply willingly (Dix & Branca, 2003). Autonomy granting strategies are thought to be sensitive to children because parents demonstrate that they are concerned with their child's desires. Conversely, strategies that use force rather than address children's concerns tend to elicit from children negative affect, resistance, and incompatible behavior (Crockenberg & Litman, 1990; Gershoff & Dix, 2002) and motivation to oppose control from parents (Brehm, 1981; Hoffman, 1983). Yielding strategies may fail to enforce important socialization rules and are a sign, not of sensitivity, but of poor discipline and inability to maintain control, resulting in parents abandoning expectations for compliance altogether (Dix & Branca, 2003).

Overall, effective parents manage interactions so that parents and children aim to have shared goals (Dix & Branca, 2003; Maccoby & Martin, 1983). Autonomy granting often achieves this, leading to cooperative, beneficial parent-child interactions and relationships. When parents practice autonomy granting, interactions with their children may be harmonious and positive, which may result in more positive child emotion (i.e., joy), less negative emotion (i.e., anger and sadness), and less flat affect (an indication that children have become non-communicative).

Maternal Sensitivity Mediating Relations of Maternal Well-Being to Children's Emotions

The second objective of this study is both to examine the direct relations between factors that reflect maternal psychological well-being and children's expressions of emotions in mother-child interactions and to determine whether maternal sensitivity mediates these relationships. This study includes three measures of maternal psychological well-being: (a) maternal depressive symptoms, (b) marital satisfaction, and (c) maternal social support. These factors are consistently associated with parenting behavior and child developmental outcomes. However, for the most part, the mechanisms by which these variables are related to parenting practices and child development have not been studied. This study will examine children's facial emotions as potential mechanisms responsible for such relations. When considering the relations between maternal psychological well-being factors and children's facial emotions, maternal sensitivity will be highlighted as a mediator of these associations.

Maternal Depressive Symptoms

Mothers with depressive symptoms and their children have more problematic interactions than mothers without depressive symptoms have with their children. These problems include difficulties with emotion regulation, less reciprocity, less contingent responsivity, fewer empathic responses to emotions, less emotional availability, less shared positive affect, less stimulation, and less compliance (Cohn, Matias, Tronick, Connell, & Lyons-Ruth, 1986; Cohn & Campbell, 1992; Cox, Puckering, Pound, & Mills, 1987; Davenport, Zahn-Waxler, Adland, & Mayfield, 1984; Downey & Coyne, 1990; Field, 1992; Field 1984; Field, Sandberg, Garcia, Bega-Lahr, Goldstein, & Guy,

1985; Fleming, Ruble, Flett, & Shaul, 1988; Gelfand & Teti, 1990; Jameson, Gelfand, Kulcsar, & Teti, 1997; Murray, 1992; Murray & Cooper, 1997; Radke-Yarrow, 1998; Radke-Yarrow & Zahn-Waxler, 1991; Redding, Harmon, & Morgan , 1990; Radke-Yarrow, Cummings, Kuczynski, & Chapman, 1985; Tronick, 1989; Zahn-Wazler, Cummings, McKnew, & Radke-Yarrow, 1984). Researchers explain that, "many of the characteristics associated with depression, such as anxiety, rumination, and especially irritability, could be important in understanding the parenting difficulties of depressed mothers and have been proposed as possible contributors to parenting problems. . ." (Lovejoy, Graczyk, O'Hare, & Neuman, 2000, p. 563). For example, depressive mothers may express more negative emotion toward their children and be less tolerant of normative child behavior. Broth, Goodman, Hall, and Raynor (2004) point out that these mothers may miss or misinterpret their young children's signals and may respond with less sensitivity to their children's needs, establishing poorer quality interaction with their children (Donovan, Leavitt, & Walsh, 1998). Together, these ideas support the proposal that children may express more negative emotions (i.e., anger and sadness), fewer positive emotions (i.e., joy), and more flat affect when mothers report significant depressive symptoms.

In line with this assumption, research has demonstrated that children of depressed mothers demonstrate more negative affect (Cohn et al., 1986; Downey & Coyne, 1990; Field, 1995; Martinez, Malphurs, Field, Pickens, Yando, Bendell, Valle, & Messinger, 1996) and less positive affect (Field et al., 1988; Pickens & Field, 1993) when interacting with their mothers. Specifically, research has shown that infants of mothers who were both depressed and reported depressive symptoms on the Beck Depression Inventory (Beck, Ward, Mendelson, Mach, & Erbaugh, 1961) showed significantly more sadness and anger expressions than infants of nondepressed mothers when interacting with their mothers (Pickens & Field, 1993). The higher rate of sadness was not surprising. However, the higher rate of anger was a novel finding that suggests that infants may be markedly upset during interactions with their depressed mothers (Pickens & Field, 1993). Pickens and Field (1993) point out that this is consistent with

reports that infants are physiologically stressed when interacting with their depressed mothers (Field, Healy, Goldstein, Perry, Bendell, Schanberg, Zimmerman, & Kuhn, 1988) and that infants' emotions parallel their mothers' emotions. Depressed mothers show more anger and sad emotions than nondepressed mothers (Cohn et al., 1986). Kelley and Jennings (2003) point out that children who have depressed mothers also exhibit fearfulness, anxiety, inhibition, and frustration (Garber, Braafladt, & Zeman, 1991; Kochanska, 1991; Malatesta-Magai, 1991; Politano, Stapleton, & Correll, 1992). Research also shows that children of depressed mothers demonstrate more flat affect (Field, 1984; see Jameson et al., 1997) than children of nondepressed mothers. Children may demonstrate more flat affect because, they may become accustomed to their mothers' depressive, non-responsive style. In turn, such children may become emotionally non-communicative in interactions with their mothers because their emotional expressions do not elicit sensitive maternal responses.

Greater maternal depressive symptoms may lead to less sensitive, responsive parenting practices, and I predict that there will be related microanalytic changes in children's emotions. I expect fewer expressions of positive (i.e., joy) emotion, more expressions of negative emotion (i.e., anger and sadness), and more flat affect in children when mothers report depressive symptoms and demonstrate related insensitive behavior.

Marital Satisfaction

Marital satisfaction is an important macrosocial variable associated with parenting practices and child development (see Stoneman, Brody, & Burke, 1989). Research has shown that marital dissatisfaction is related to insensitive parenting behaviors (Cox, Owen, Lewis, & Henderson, 1989; Goldberg & Easterbrooks, 1984; Jouriles, Murphy, & O'Leary, 1989). Because risk factors such as marital dissatisfaction may increase mothers' propensity for insensitive parenting, I expect to see microanalytic changes in children's emotions as a result. That is, children of mothers experiencing marital dissatisfaction who are exposed to less sensitive parenting may express fewer positive and more negative emotions during interactions with their

mothers. Although there is much research demonstrating an association between marital satisfaction and child development outcomes, studies providing evidence demonstrating the link between marital satisfaction and children's facial emotion in mother-child interactions do not exist.

Poor marital quality may affect the general well-being of parents, compromising their parenting competence. This can result in parent-child relations that ultimately undermine children's behavioral and emotional development (Belsky, 1984). In line with this mediational view, the spillover hypothesis suggests that the quality of the parent-child relationship may suffer due to poor marital quality (Belsky, 1981, 1990; Engfer, 1988; Emery, Hetherington, & Dilalla, 1984). Marital dissatisfaction may "spillover" into the parent-child relationship and negatively affect children's psychological or emotional well-being (Erel & Burman, 1995). This should, in turn, affect children's emotions. Shek (1998) explains that this position is based on findings showing that parents in marriages with poor marital quality demonstrate less competent parenting practices, such as "increased hostility and punitiveness. . ., decreased warmth and reasoning. . ., and increased inconsistency and ineffective parenting. . ., all of which would adversely affect the parent-child relationship quality" (p. 1). For example, researchers have found that mothers are less inclined to interact positively and participate in conversation with their pre-school aged sons if they experience marital dissatisfaction and related negative moods (Jouriles et al., 1989). Another study showed that among parents of 20-month olds, marital satisfaction and harmony were associated with less strict and more supportive parental attitudes and fewer feelings of irritation toward the child (Goldberg & Easterbrooks, 1984). Likewise, mothers who described a close relationship with their husbands were also sensitive and warm toward their infants in play interactions (Cox et al., 1989). According to the spillover hypothesis, marital dissatisfaction may result in compromised parenting that undermines the parent-child relationship, which may lead to fewer positive and more negative emotional expressions in children.

Marital dissatisfaction may increase mothers' insensitive parenting, leading to microanalytic changes in children's emotions. I predict that low marital satisfaction will be related to fewer expressions of positive emotion (i.e., joy), more expressions of negative emotion (i.e., anger and sadness), and more flat affect in children when interacting with their mothers.

Maternal Social Support

Mother-child relationships do not "evolve in a social vacuum" (Jennings, Stagg, & Connors, 1991, p.966), and parenting cannot be understood in isolation from the larger social environment in which it is embedded. Earlier research on social support often utilized Cobb's (1976) conceptualization of social support, "who defined such support as information that leads an individual to believe that he or she is cared for and loved, valued, and a member of a network of mutual obligation" (Cochran & Niego, 1995, p. 397). Crockenberg (1988) has since defined the concept of social support as emotional, instrumental, or informational help. Specifically, ". . .emotional support refers to expressions of empathy and encouragement. . .in order to do a good job in [the parenting] role. . . .Instrumental support refers to concrete help that reduces the number of tasks or responsibilities a parent must perform. . .Informational support refers to advice or information concerning child care or parenting" (Crockenberg, 1988, p. 141).

Maternal social support is considered an important variable affecting parenting attitudes, beliefs, and behavior, impacting the mother-child relationship and child development (Andreson & Telleen, 1992; Belsky, 1984, Cochran & Brassard, 1979; Crittenden, 1985; Crnic & Greenberg, 1990; Crnic, Greenberg, Ragozin, Robinson, & Basham, 1983; Crnic, Greenberg, Robinson, & Ragozin, 1984; Melson, Ladd, & Hsu, 1993; Powell, 1979; Stevens, 1988). Research on mothers with infants and toddlers demonstrates that socially supportive networks are associated with parenting practices that are considered beneficial for children's development and mother-child relationships (Colletta, 1981; Crnic et al., 1984; Crockenberg, 1981; Durrett, Otaki., & Richards, 1984; Stevens, 1988). Jennings et al. (1991) explain, for example, that attachment security at one year is related to more maternal role support at three months

(Crockenberg, 1981) and to having a stable supportive network (Crittenden, 1985). Studies with infants and toddlers have also demonstrated a relationship between social support and quality of maternal stimulation. This is evident in the mother's verbal and emotional responsiveness and her ability to provide a stimulating, yet safe environment for infants (Adamakos, Ryan, Ullman, Pascoe, Diaz, & Chessare, 1986; Parks, Lenz, & Jenkins, 1992). Research on families with preschool-age children has also revealed an association between maternal social support and parenting competence. Jennings et al. (1991) state that higher scores on the Home Observation and Measurement of Environment Inventory (HOME) (Bradley & Caldwell, 1979), a tool used to measure parenting skills, have been shown to relate to greater informational support (Cotterell, 1986; Stevens, 1988) and to greater help with daily household tasks (Pascoe & Earp, 1984; Pascoe, Loda, Jeffries, & Earp, 1981). Jennings et al. (1991) also explain that in an interview, mothers with more supportive networks described their parenting as less restrictive and punitive (Colletta, 1979), and in observations of mother-child play interactions, maternal support predicted more optimal parenting behavior (Weinraub & Wolf, 1983, 1987). Taken together, this research supports the idea that maternal social support, because it is associated with maternal sensitivity, may ultimately affect children's expressions of emotion.

Greater maternal social support may lead to more sensitive parenting behavior and, in turn, to microanalytic changes in children's emotions. I predict greater maternal social support will be associated with more expressions of positive emotion (i.e., joy), fewer expression of negative emotion (i.e., anger and sadness), and less flat affect in children when interacting with their mothers.

Maternal Sensitivity Mediating Relations of Family Demographics to Children's Emotions

The third objective of this study is both to examine the direct relations between family demographic factors and children's expressions of emotions in mother-child interactions and to determine whether maternal sensitivity mediates these associations. Three demographic factors are measured in this study: (a) family socioeconomic status (b) maternal education, and (c) family income. Research has shown associations

between these demographic factors and both parenting practices and child development outcomes, but little research has examined the process behind these associations. Examining associations between these factors and children's facial emotions, highlighting maternal sensitivity as a mediator of these associations, may help to reveal such processes. Maternal education and family income are components of SES, but I include separate measures of these variables (see Bornstein, Hahn, Suwalsky, and Haynes, 2003), in order to clearly demonstrate the separate sources of effect that such individual indicators bear on the outcome variables (DeGarmo, Forgatch, & Martinez, 1999; Magnuson & Duncan, 2002; Smith & Graham, 1995). Relying completely on an index of SES provides little explanatory power. Rather, examining component parts that comprise SES is more revealing, because the multiple variables that define SES may act separately, each influencing different domains of parenting (see Bornstein et al., 2003, p.67).

Demographic factors predict variation in parenting behaviors, child outcomes (see Bornstein et al., 2003, p. 65), and likely child emotions. Infancy and toddlerhood are especially appealing and interesting times to explore the relations between such distal variables, parenting, and child emotions, because, "during the very first years of life, almost everything a child experiences and learns depends on his or her immediate environment and what parents provide physically, emotionally, intellectually, and materially (Bornstein, 2002; Bradley & Corwyn, 2002)" (Bornstein et al., 2003, p. 33). However, little is understood about which specific demographic features affect which specific facets of parenting, child development (Bornstein et al, 2003), and children's emotional expressions, in turn. Lerner (2003) explains that despite voluminous research on the associations between SES, family structure and function, and child development, "a. . . key theoretical question remains moot. . . 'by what mechanisms do marco contextual variables represented by SES translate into a developmental process that results in the behaviors of parents or children [e.g., children's expressed emotions]. . .?'" (p. 231). Children's emotions may represent one mechanism by which SES variables influence mother-child interactions and children's development. This study

will consider the relations between demographic factors and children's facial emotion underscoring maternal sensitivity as a mediator of these associations.

Family Socioeconomic Status

Evidence clearly suggests that both parenting style and specific parenting behaviors differ as a function of SES. I expect that SES, which is associated with maternal sensitivity, will ultimately affect children's expressions of emotion. Hoff-Ginsberg and Tardif (1995) discuss the literature on the differences in parenting behaviors associated with SES: the middle-class was "consistently reported as more acceptant and equalitatiran," while the working-class were focused on "maintaining order and obedience" (Bronfenbrenner, 1958, p. 420). Hoff-Ginsberg and Tardif (1995) also explain that research has shown that higher SES households are more democratic, and lower SES households are more authoritarian (Hoffman, 1963); higher SES parents are less punitive than lower SES parents (Gecas, 1979; Hess, 1970; Kamii & Radin, 1967); higher SES homes are found to be more child-centered, while lower SES homes are more parent-centered (Sears, Maccoby, & Levin, 1957; Skinner, 1985). SES also has been found to have negative associations with physical and harsh punishment (Pinderhughes, Dodge, Bates, Pettit, & Zelli, 2000). When mothers have been observed interacting with their young children, mothers of lower SES were more controlling, restrictive, and disapproving than higher SES mothers (see Hoff-Ginsberg & Tardif, 1995). These differences in parenting behavior reveal the apparent disruption in sensitive parenting as it relates to SES-associated risk status. Competent, sensitive parenting can serve as a protective factor and predicts fewer negative outcomes and greater positive outcomes for children facing adversity (see Kim-Cohen, Moffitt, Caspi, & Taylor, 2004; Raver, 1996). If children of low SES mothers are exposed to less sensitive parenting, these children may express fewer positive emotions (i.e., joy), more negative emotions (i.e., anger and sadness), and demonstrate more flat affect when interacting with their mothers.

Maternal Education

Maternal education is a consistent predictor of infant behavior and has been associated with parenting behaviors across ethnic groups and cultures (see Bornstein et al., 2003). Researchers maintain that, "education seems to be the most important variable in accounting for SES-associated differences in parenting beliefs and behaviors. . . for both majority and minority populations in the United States (Kelley, Sanchez-Hucles, & Walker, 1993; Laosa, 1980; J. D. Wright & S. R. Wright, 1976)" (Hoff-Ginsberg & Tardif, 1995, p. 170). Further, Bornstein et al. (2003) point out that education is probably the most common indicator of SES (Ensminger & Fothergill, 2003; Entwisle & Astone, 1994) and is correlated with SES as a whole at .69 (Bradley, Caldwell, Rock, & Ramey, 1989). Maternal education has far reaching impacts for mothers and their children and for the human capital mothers provide their children. That is, education is associated with more knowledge of parenting and child development (see Bornstein et al., 2003). Additionally, greater maternal educational attainment is related to stimulating home environments that afford children positive experiences (Bradley, 1985), while low maternal educational attainment is related to mothers' inability to effectively parent and to create a beneficial home environment (Gottfried & Gottfried, 1984). High maternal education may be associated with more maternal sensitivity, leading to more expressions of positive emotion (i.e., joy), fewer expression of negative emotion (i.e., anger and sadness), and less flat affect in children when interacting with their mothers.

Family Income

Income is another key component of SES. It provides families the resources they must have to meet physical needs and provide material goods for their children (Bornstein et al., 2003). Income figures prominently in discussions that explain the effects of SES on parenting and child outcomes, because levels of risk or stress are high in low-income households (Hoff-Ginsberg & Tardif, 1995). Research has shown that children in low-income families are at an elevated risk for numerous negative outcomes. For example, negative outcomes include exhibiting lower levels of behavioral,

cognitive, and social functioning compared to other children (see Bradley & Corwyn, 2002; Brooks-Gunn & Duncan, 1997; Conger, Conger, Elder, Lorenz, Simons, & Whitbeck, 1992; McLoyd, 1990; McLoyd, 1998; Smith, Brooks-Gunn, & Klebanov, 1997). Additionally, studies employing interview and observational methods demonstrate that mothers who are poor are more likely than advantaged mothers to use parenting techniques likely to elicit negative emotions in children. For example, they may adopt power-assertive techniques of parenting, use physical means of punishment, use less reasoning with their children, and generally are less supportive and warm (see Kim-Cohen et al., 2004; McLoyd & Wilson, 1994; Middlemiss, 2003), which is associated with children's behavior problems (see Kim-Cohen et al., 2004) and perhaps low positive and high negative emotional expression. However, there is no evidence demonstrating the link between family income and children's facial emotion.

Raver (1996) explains that the "empirical portrait" of the medational role of parenting within low-income families is often unfavorable, and "compared with their middle-income counterparts, low-income parents appear to transmit the stress of poverty to their children by becoming less sensitive, less-emotionally positive, more punitive, and more rejecting (McLoyd & Wilson, 1991)" (p. 225). Researchers point out, "the fact that child rearing practices more prevalent among impoverished parents (e.g., harsh discipline, nonsupportiveness) predict a range of socioemotional problems strongly suggests that at least some of the psychological and behavioral problems of poor children are mediated by negative parenting precipitated by economic hardship" (McLoyd & Wilson, 1994, p. 112). Elder's studies of families who suffered job loss or severe income loss during the Great Depression demonstrate a mediational pathway. McLoyd and Wilson (1994) explain that fathers in these families were more irritable, tense, and explosive, which elevated the likelihood that they would exhibit harsh and inconsistent parenting behaviors; in turn, this led to irritability, negativism, and moodiness in their children (Elder, 1979; Elder, Liker, & Cross, 1984; Elder, Nguyen, & Caspi 1985). More recent studies demonstrate findings consistent with Elder's mediational model, which leads to the expectation that low maternal sensitivity predicts

negative child outcomes in low income families (see McLoyd & Wilson, 1994) and more negative child emotions and fewer positive child emotions.

The association between family income and children's emotions may be mediated by maternal sensitivity. Family income may increase or decrease mothers' sensitive parenting, leading to predictable child emotional expressions. Children from low income or poor families may demonstrate fewer expressions of positive emotion (i.e., joy), more expressions of negative emotion (i.e., anger and sadness), and more flat affect when interacting with their mothers.

A Process Model of the Predictors of Children's Facial Emotions

A process model of the predictors of children's facial emotions is presented (see figure 1). The model presumes that children's expressions of emotions in mother-child interactions are directly influenced by maternal sensitivity. Factors from a mother's broader macrosocial context in which the parent-child relationship is embedded (e.g., maternal risk and protective factors) may also directly affect a child's expressions of emotions. This study will highlight maternal sensitivity as a mediator of the relations between macrosocial factors and children's facial emotions. Because individual differences in children may affect children's emotional expression in mother-child interactions, this study will control for three important child characteristics: (a) temperament, (b) age, and (c) sex.

Method

Participants

Participants were a community sample of 94 mothers and their 14- to 27-month old toddlers. Mothers ranged from 19 to 43 years old (mean age = 31 years). The toddler sample was 52% male and 48% female (mean age = 20 months). Dyads were recruited from birth announcements in the daily newspaper of a mid-sized city (60%) and advertisements in a free weekly paper (40%). Because the study was part of a project that examined marital relations, mothers were either married and living with their spouse or unmarried and living with the same partner for over six months. Eighty-nine percent were Anglo-American; 10%, African American; 1%, other. Forty-three percent had completed high school; 18% had some college; 31% had completed college; and 5% had graduate education. The average family annual income reported was $40,000 to $50,000. According to Hollingshead's (1975) Four-Factor Index of socioeconomic status, 39% of families were working class, 40% were middle class, and 21% were upper-middle to upper class. Mothers received $15 after participating in the first session and $20 after the second session.

Procedure

Interactions. In a laboratory playroom, each mother-child dyad participated in a 20-minute interaction that had three parts. During the first five minutes, the *waiting period*, mothers were asked to complete a demographic questionnaire while waiting for the experimenter to return with toys for the child. No toys were provided for the child during the waiting period. This allowed researchers to observe how mothers interact with children when children have little to do and mothers' attention is on another activity. During the 10-minute *play period* that followed, the experimenter entered the room with a toy box containing a variety of toys, including four attractive toys that were placed against a wall. Mothers were asked to interact with their children as they do normally, but children were not permitted to play with the four attractive toys. During the final five minute *clean up period*, the experimenter entered the room and said it was time for clean up. The experimenter asked the mothers to get their children to help put

the toys back into the toy box. In each of the three periods, the room contained items that may have introduced a problematic situation. These items included: a water pitcher, a stack of drinking cups, paper towels, a television, eyeglasses, a sealed jar of candy, boxes of tissue, a videocassette recorder, and videocassettes. Two video cameras recorded the interaction from behind a one-way observation mirror. One camera recorded the interaction as a whole, while the other camera was focused on the child's face in order to capture child facial expressions in detail. After completing the interaction, mothers completed a series of questionnaires.

Mothers' reports of their concerns and emotions. Mothers' emotions that occurred in the interaction and then the concern or motivation that was the basis of each emotion was measured. Following the 20-minute interaction, mothers reviewed tape-recordings of the interactions to indicate the emotions that they had experienced at each moment of the interaction, a procedure adapted from Gottman and Levenson (1985). While watching the interaction, mothers moved a dial along an 11-point scale from -5 (extremely negative emotion) to 0 (no emotion) to 5 (extremely positive emotion) to indicate their felt emotion at each moment. When mothers moved the dial, the experimenter paused the video and asked them to choose a set of emotion words, from six sets, that best identified their feelings. The six sets corresponded to Izard's principal emotions from the AFFEX facial coding system (Izard, Dougherty, & Hembree, 1983). Emotions included: (a) joyful, pleased, happy; (b) flat affect (c) angry or irritated; (d) sad or disappointed; (e) worried, concerned, or fearful; and (f) guilty. To determine the concern underlying each basic emotion, the experimenter asked about the cause of the emotion (e.g., "You were happy because…?"). Mothers' reports about their emotions were recorded on audiotape, transcribed, and coded as either child- or parent-oriented.

Measures

Children's facial emotions. Izard's AFFEX facial coding system (Izard et al., 1983) was used to assess children's facial emotions during the entire 20-minute interaction. The AFFEX system is well validated and has been used extensively in emotion research. The AFFEX system yields two kinds of scores: pure facial emotion

and blended facial emotion. Coders assessed the facial musculature of both the upper and lower zones of the child's face, assigning each zone a facial code using the AFFEX system and then systematically combined these codes to create a final facial emotion code. Eight coders coded 22% of the videotapes for AFFEX coding reliability, and the average real time agreement was 84%.When both zones received the same code, the final facial emotion code was coded "pure." When the zones received different codes, the final facial emotion code was coded "blended." I analyzed only pure facial emotions because of the inherent ambiguity in blended facial emotions. If one or both zones of the child's face was either obscured (i.e., was not viewable) or not codable (i.e., did not correspond to any of the AFFEX codes), the facial emotion was not analyzed.

Facial emotion codes were: joy, flat affect, anger, sadness, surprise, disgust, contempt, fear, shame, and pain. Some facial emotions occurred with extremely low frequencies: 95% of the sample either never showed disgust or did so only once; 97% of the sample either never showed fear or did so only once; 97% of the sample either never showed pain or did so only once; 100% of the sample never showed contempt or shame. These emotions were not analyzed. Fifty percent of the sample expressed surprise, but it is not an emotion in the same sense as joy or anger—it is activated by a quick increase in stimulation (Izard, 1991). Thus, surprise was not analyzed. I analyzed the following four facial emotions: 100% of the sample expressed joy and flat affect, 43% of the sample expressed anger, 34% of the sample expressed sadness. Eighty-five percent of children's expressed emotions were analyzed pure emotions.

Maternal supportive behavior. A 5-category behavioral coding system was developed to measure maternal supportive behavior in the 10-minute play period. Supportive behavior is defined as "action that connected to and supported children's immediate wants, interest, and intentions" (Dix et al., 2004). Coders watched the videotaped interactions and assigned one of the five behavior codes to each 5-second interval of the interaction: high synchrony, asynchrony, restrictiveness, low synchrony, and watching. Interrater reliability on coding supportive behavior was assessed on 20% of the videotapes, which were independently coded by two observers. Two codes

(watching and low synchrony) were included to enable the codes to be exhaustive and mutually exclusive but did not provide information about mothers' support for children's intentions. A code of restrictiveness, which measured maternal control or socialization attempts, was assigned to behavior that attempted to get the child to conform to maternal standards of behavior. Two codes (high synchrony and asynchrony) clearly indicated high support or lack of support for children's interests. Behavior was assigned a code of high synchrony when it was contingent on children's behavior and supported their wants and interests. High synchronous behaviors included contingent responses to the child's signals, positive expressions related to the child's actions, statements about the child's exact activities, and inquiries about the child's thoughts and feelings. Asynchrony indicated absence of support. Behavior was assigned a code of asynchrony when it was either detached from or resisted what the child wanted. Asynchronous behaviors included mothers failing to respond to children's signals, focusing on a different activity than the child, trying to change the child's focus of attention, and criticizing the child. Agreement among coders was good, Cohen's Kappa = .71.

Theoretically, because high synchrony and asynchrony indicated high support or lack of support for children's interests, they were included in analyses. Additionally, sampling adequacy was measured using the Kaiser-Meyer-Olkin (KMO) statistics to determine whether to factor analyze supportive behavior codes to create an aggregated score. The overall KMO statistic rose above .60 after dropping watching and restrictiveness. After dropping low synchrony, two codes, high synchrony and asynchrony, remained. The strength of association between high synchrony and asynchrony was high ($r = 0.480$, $p < 0.001$). A single supportive behavior score was created by combining high synchrony and asynchrony: asynchrony was recoded to yield its inverse, and then the recoded asynchrony scores and high synchrony scores were averaged to create a single supportive behavior score.

Child-oriented motivation. Mothers' reasons for their emotions during the 20-minute interaction were reported and coded to assess whether mothers experienced each

emotion because how events affected children and related to maternal concerns for children (child-oriented concerns) or how events directly affected mothers (parent-oriented concerns). Concerns related to each emotion were coded child-oriented when they were due to mothers' concern for the child's welfare or interests (e.g., "I was pleased that he finally found something he liked," "I was worried because I thought he might fall," and "I was irritated because the study was frustrating him;" Dix et al., 2004). Parent-oriented concerns were coded when mothers expressed concern about their own interests rather than their child's interests in the interaction. Concerns were coded as parent-oriented when mothers were concerned about child conduct being proper, about the child's conforming to parental standards or expectations, or when events reflected well on mothers (e.g., "I was irritated because I asked him to put the toy down," "I was pleased because I didn't want to have to walk over there;" Dix et al., 2004). Coders applied the codes based on transcripts of mothers' explanations. Interrater reliability across coders was good, Cohen's Kappa = .86.

Maternal autonomy granting. During the five-minute clean up period, mothers' statements made to children were coded. Based on strategies discussed by Dix and Branca (2003), an autonomy granting behavior code was created to identify statements that attempted to influence children when parents' and children's goals were conflicting. Autonomy granting statements included those that considered children's needs or interests and reflected mothers' attempts to influence children's motivation so that children willingly complied when mothers were trying to get them to clean up. Five forms of autonomy granting control make up the code. *Sequencing* statements communicated that that child's interests would be attended to soon, if not immediately (e.g., "you can play with that after we clean up"). *Adapting* statements represent a mother's consideration of the child's age and interests and her attempt to match it appropriately (e.g., making clean up more fun by playing a game or singing a song about clean up). *Justifying* statements attempt to motivate the child to comply willingly by demonstrating the value of a mother's request (e.g., "Don't you want to clean up the room for Mommy and the nice lady"). *Compromising statements* demonstrate that both

parent and child can achieve part of what they wanted if each gave up part in order to encourage cooperative motivation (e.g., "If you put away those toys, we can play with this one.") *Statements about Children's Wants* show a concern for the child's interests, preferences, and motivations (e.g., "Do you know what you want to play with?"). Statements that did not fall into one of these categories were coded *other* and were not included in analyses. Interrater reliability on coding maternal autonomy granting behaviors was assessed on 20% of the videotapes, which were independently coded by two observers. Agreement among coders was good, Cohen's Kappa = .77. Because scores had low frequencies, inter-correlated, and reflected the same underlying construct, a single autonomy granting score was created by summing four of the five behaviors. Compromising seemed to be a different form of behavior than the other four codes and was not included, because its relations with children's behavior in control situations were opposite of those demonstrated by the other autonomy granting codes.

Maternal depressive symptoms. To assess mothers' depressive symptoms, mothers completed the Center for Epidemiological Study Depression Inventory (CES-D; Radloff, 1977) at the end of the first session. Mothers indicated the extent to which 20 statements characterized them over the last week (e.g., I had crying spells," "I felt sad," "I felt that people dislike me," "I enjoyed life," "I was happy"). This scale is well validated and is correlated with measures of psychopathology and negative affect and distinguishes psychiatric from normal populations (Radloff, 1977). This scale has high internal consistency and has demonstrated both split-half reliability (.78) and Spearman-Brown reliability (.88) (Radloff, 1977).

Marital satisfaction. The Marital Opinion Questionnaire (Huston & Vangelisti, 1991) was used as an assessment of mothers' happiness with their spouse or partner. The questionannire, adapted from a measure of life satisfaction (Campbell, Converse, & Rodgers, 1976), has two parts. One part is composed of 10 7-point semantic differential scales in which participants characterize their relationship with bipolar adjectives (e.g., miserable-enjoyable, rewarding-disappointing, worthwhile-useless). The other part is a single-item, 7-point assessment of participants' overall satisfaction with their

relationship. Participants responded about their relationships over the past two months. This instrument is well validated (Huston & Vangelisti, 1991). Alpha coefficients of the semantic differential scales are high, ranging from .88 to .94, and the correlations between the semantic differential totals and the single item assessment range from .63 to .80 (Huston & Vangelisti, 1991). The average rating of the semantic differential items was added to the score on the overall marital satisfaction assessment and divided by two to create an index of marital satisfaction ranging from low (1) to high (7).

Maternal social support. Social support was measured using the well validated and widely used 27-item Social Support Questionnaire (SSQ; Sarason, Levine, Bashan, & Sarason, 1983). For each item, participants are asked to list the people they can rely on for support in a given set of circumstances. Participants are also asked to indicate their overall level of satisfaction with the support provided ranging on a scale from "very satisfied" to "very dissatisfied." The average of the satisfaction scores was the maternal social support score. The alpha coefficient for satisfaction scores is .94.

Family demographics. Three demographic factors were examined: family SES, maternal education, and family income. SES was based on the education and occupation status of both parents, if both were working (see Hollingshead, 1975). Mothers reported the years of formal education that they completed and their yearly family income.

Control variables. Three child control variables were examined: age, sex, and temperament. To assess child temperament, mothers were asked to complete four scales from the well-established Toddler Behavior Assessment Questionnaire (TBAQ; Goldsmith, 1996). The TBAQ is a 109-item questionnaire that measures five dimensions of temperament in toddlers; four of which were measured in this study: anger, pleasure, activity level, and social fearfulness. The questionnaire elicits ratings on a 7-point scale of the prevalence of discrete, temperament-relevant child behaviors (e.g., "runs through the house," "protests by crying loudly," "allows her/himself to be picked up [by a stranger] without protest").

Results

Descriptive Data

Table 1 displays the means and standard deviations for the study's primary variables. Flat affect accounted for 67% of expressed child emotions, and joy accounted for 16%. Sadness accounted for 1.1% of expressed child emotions, and anger accounted for 1.2%. Mothers displayed supportive behavior 75% of the time while interacting with their children during the play period. Mothers reported more parent-oriented motivation (55%) than child-oriented motivation (45%) when reviewing the interactions with their children. Mothers made autonomy granting statements about 7 times (every 41 seconds) during the five minute clean up period. Approximately 20% of mothers reported clinically significant levels of depressive symptoms (a CES-D score $\geq$ 16). On average, mothers reported that they were fairly satisfied with their social support and were between neural and completely satisfied on their reports of marital satisfaction.

Overview

Data analysis is divided into three main parts: (1) maternal sensitivity: the direct relations between the three maternal sensitivity variables and children's emotions (see Table 3); (2) maternal psychological well-being: (a) the direct relations between maternal psychological well-being variables and children's emotions, (b) the direct relations between maternal psychological well-being variables and the three maternal sensitivity variables in order to establish criteria for testing mediation, (c) mediational effects of the three maternal sensitivity variables on the relations of maternal psychological well-being variables to children's emotions (see Tables 4-6); and (3) family demographics: (a) the direct relations between family demographic variables and children's emotions, (b) the direct relations between family demographic variables and the three maternal sensitivity variables in order to establish criteria for testing mediation, (c) mediational effects of the three maternal sensitivity variables on the relations of family demographic variables to children's emotions (see Tables 7-9).

To test whether relations between independent variables and children's facial emotions were mediated by maternal sensitivity variables, I employed the regression

procedure described by Baron and Kenny (1986). With this procedure, mediation is determined if (a) the independent variable significantly relates to the mediating variable; (b) the independent variable significantly relates to the dependent variable without a mediating variable; (c) the relation between the mediating variable and the dependent variable is significant and unique; and (d) the relation between the independent and dependent variable significantly declines when controlling for the mediating variable, which can be determined using the Sobel test. Thus, the mediator is responsible for the influence of the independent variable on the dependent variable (Preacher & Leonardelli, 2001).

Associations between the three maternal sensitivity measures and the six macrosocial maternal factors (i.e., psychological well-being and demographics) were analyzed using linear regression. Because children's emotions were count data and were skewed, I used Poisson regression analysis to test the relationships among variables when child emotion was the dependent variable. Poisson regression is considered the "benchmark model" for the analysis of count data (Cameron & Trivedi, 1990). All equations include six control variables—four temperament variables (i.e., anger, pleasure, activity level, and social fearfulness) and child age and sex.

Maternal Sensitivity

Table 2 displays the relations among the four children's emotions. Children who expressed more joy expressed less flat affect and anger. Children who expressed more sadness also expressed more anger. Table 3 displays the relations of maternal sensitivity measures to child emotions. I expected that maternal sensitivity variables would be positively related to positive child emotion (i.e., joy) and negatively related to both negative child emotion (i.e., anger, sadness) and flat affect.

Maternal Supportive Behavior

As predicted, mothers who displayed more supportive behavior had children who expressed more joy and less flat affect. However, mothers who displayed more supportive behavior had children who expressed more, not less sadness, a finding opposite to my prediction.

Child-Oriented Motivation

As predicted, mothers who reported more child-oriented motivation had children who expressed more joy and less flat affect. However, like the results for supportive behavior, mothers who reported more child-oriented motivation had children who expressed more, rather than less child sadness, an unexpected finding. Child-oriented motivation was unrelated to child anger.

Maternal Autonomy Granting

Autonomy granting was unrelated to child joy, flat affect, and sadness. Unexpectedly, mothers who demonstrated more autonomy granting had children who expressed more, not less, child anger. Thus, autonomy granting did not conform to the expectation that it would predict less negative and more positive child emotion.

Maternal Psychological Well-being

Maternal Depressive Symptoms

Direct relations of depressive symptoms to child emotions. As predicted, mothers with more depressive symptoms had children who expressed less joy and more flat affect (see Table 4). Mothers with more depressive symptoms also had children who expressed less sadness, contrary to predictions (see Table 4). Thus, with regard to joy, flat affect, and sadness, depressive symptoms were related to an overall dampening of child emotion. Depressive symptoms were unrelated to child anger.

Indirect relations of depressive symptoms to child emotions. I examined whether maternal sensitivity variables mediated the associations of depressive symptoms to child emotions. In order to determine whether the criteria for testing mediation were met, I examined the relations of depressive symptoms to the three maternal sensitivity variables. Mothers with more depressive symptoms displayed less supportive behavior and less child-oriented motivation (see Table 4). Depressive symptoms were unrelated to autonomy granting; thus, there was no evidence that autonomy granting mediated the relations between depressive symptoms and joy, flat affect, and sadness. Because depressive symptoms were unrelated to child anger, there was no relation to mediate.

Overall, evidence of mediation of the relations between depressive symptoms and child emotions was present in four cases.

The relation of depressive symptoms to low joy was entirely mediated by maternal supportive behavior. This is consistent with the idea that children of mothers with more depressive symptoms expressed low joy because their mothers displayed low levels of supportive behavior. Because the relation of child-oriented motivation to joy (with depressive symptoms in the equation) was not significant, the relation of depressive symptoms to joy was not mediated by child-oriented motivation.

Like joy, the relation of depressive symptoms to high flat affect was entirely mediated by maternal supportive behavior. This supports the idea that children of mothers with more depressive symptoms expressed more flat affect because their mothers displayed low levels of supportive behavior. Additionally, the relation of depressive symptoms to high flat affect was partially mediated by child-oriented motivation. This supports the idea that children of mothers with more depressive symptoms expressed more flat affect, in part, because their mothers reported less child-oriented motivation.

The relation of depressive symptoms to low sadness was partially mediated by child-oriented motivation. This is compatible with the assertion that children of mothers with more depressive symptoms expressed low sadness, in part, because their mothers reported less child-oriented motivation. Because the relation of supportive behavior to sadness (with depressive symptoms in the equation) was not significant, the relation of depressive symptoms to sadness was not mediated by maternal supportive behavior.

Overall, maternal supportive behavior proved to be a mediator of the relationship between maternal depressive symptoms and both low joy and low flat affect. Child-oriented motivation was a partial mediator of the relationship between maternal depressive symptoms and both high flat affect and low sadness.

Marital Satisfaction

Direct relations of marital satisfaction to child emotions. Mothers reporting greater marital satisfaction had children who expressed less flat affect but more anger

(see Table 5). The negative relationship with flat affect was predicted, but the positive relationship with anger was unexpected. Marital satisfaction was unrelated to joy and sadness.

Indirect relations of marital satisfaction to child emotions. I examined whether the maternal sensitivity variables mediated the associations of marital satisfaction to child emotions. In order to determine whether the criteria for testing mediation were met, I examined the relations of marital satisfaction to the three maternal sensitivity variables. Mothers reporting greater marital satisfaction displayed more supportive behavior (see Table 5). Marital satisfaction was unrelated to child-oriented motivation and autonomy granting; thus, there was no evidence that these variables mediated the relations between marital satisfaction and flat affect and anger. Because marital satisfaction was unrelated to children's expressions of joy and sadness, there were no relations to mediate for these variables. Evidence of mediation for the relations between marital satisfaction and child emotions was present in only one case: maternal supportive behavior proved to entirely mediate the relationship of marital satisfaction to flat affect. This is in line with the idea that children of mothers with more marital satisfaction expressed less flat affect because their mothers displayed more supportive behavior.

Maternal Social Support

Direct relations of social support to child emotions. Social support was unrelated to joy, flat affect, and sadness. Child anger yielded results contrary to those expected. Mothers reporting more social support had children who expressed more anger (see Table 6). Thus, although it is a negative child emotion, anger was positively related to both marital satisfaction and social support.

Indirect relations of social support to child emotions. I examined whether maternal sensitivity variables mediated the associations of social support to child emotions. In order to determine whether the criteria for testing mediation were met, I examined the relations of social support to the three maternal sensitivity variables. Social support was unrelated to all three of the maternal sensitivity measures:

supportive behavior, child-oriented motivation, and autonomy granting (see Table 6); thus there was no evidence that any of these measures mediated the relations between social support and anger. Because social support was unrelated to children's expressions of joy, flat affect, and sadness, there were no relations to mediate for these variables.

Family Socioeconomic Status

Direct relations of SES to child emotions. As predicted, mothers in families with high SES had children who expressed more joy (see Table 7). SES was unrelated to flat affect, sadness, and anger.

Indirect relations of SES to child emotions. I examined whether maternal sensitivity variables mediated the association of SES to child emotions. In order to determine whether the criteria for testing mediation were met, I examined the relations of SES to the three maternal sensitivity variables. SES was unrelated to all three of the maternal sensitivity measures: supportive behavior, child-oriented motivation, and autonomy granting (see Table 7); thus there was no evidence that any of these measures mediated the relations between SES and joy. Because SES was unrelated to children's expressions of flat affect, sadness, and anger, there were no relations to mediate for these variables.

Maternal Education

Direct relations of maternal education to child emotions. As expected, mothers with high education had children who expressed more joy and less sadness and anger (see Table 8). Maternal education was unrelated to flat affect.

Indirect relations of maternal education to child emotions. I examined whether maternal sensitivity variables mediated the associations of maternal education to child emotions. In order to determine whether the criteria for testing mediation were met, I examined the relations of maternal education to the three maternal sensitivity variables. Mothers with high education displayed more supportive behavior (see Table 8). Maternal education was unrelated to child-oriented motivation and autonomy granting; thus, there was no evidence that these measures mediated the relations between maternal education and joy, sadness, and anger. Because maternal education was

unrelated to flat affect, there was no relation to mediate. Evidence of mediation on the relations between maternal education and child emotions was present in only one case; the relation of maternal education to joy was partially mediated by maternal supportive behavior. This is compatible with the view that children of mothers with more education expressed more joy, in part, because their mothers displayed more supportive behavior.

Family Income

Direct relations of income child emotions. As predicted, mothers from families with high incomes had children who expressed more joy. Income was unrelated to flat affect, sadness, and anger (see Table 9).

Indirect relations of income to child emotions. I examined whether maternal sensitivity variables mediated the associations of income to child emotions. In order to determine whether the criteria for testing mediation were met, I examined the direct relations of income to the three maternal sensitivity variables and child emotions. Mothers in families with high incomes displayed more supportive behavior (see Table 9). Income was unrelated to autonomy granting and child-oriented motivation; thus, there was no evidence that these measures mediated the relations between family income and joy. Because income was unrelated to flat affect, sadness, and anger, there were no relations to mediate for these variables. Evidence of mediation on the relations between income and child emotions was present in only one case: the relation of income to joy was entirely mediated by maternal supportive behavior. This supports the notion that children of families with high incomes expressed more joy because their mothers displayed more supportive behavior.

Discussion

Children's emotions serve as critical affective regulators of mother-child interactions and reveal children's evaluations of how such interactions are proceeding. A process model of the predictors of children's facial emotions in mother-child interactions was tested to determine whether three maternal sensitivity variables (i.e., supportive behavior, child-oriented motivation, and autonomy granting) were related to children's expressions of emotions in mother-child interactions. This model was also tested to determine whether macrosocial maternal well-being and family demographic factors were related to children's expressions of emotions and whether the sensitivity variables mediated the relations between the macrosocial factors and children's emotions.

Earlier data on the relations of maternal sensitivity and child emotions has examined measures of maternal responsive behavior as predictors of child emotions. However, to my knowledge, this study is the first to examine the associations between either maternal child-oriented motivation or maternal autonomy granting and child emotions. Unlike other research, discrete child facial emotions with freely interacting participants were microcoded in this study. Additionally, the data reveal that two of the three measured components of sensitivity appear to be directly associated with children's emotional expressions in similar ways. When mothers either demonstrated more supportive behavior or possessed more child-oriented motivation, their children expressed more joy, less flat affect, and more sadness. Maternal autonomy granting was unexpectedly related to child facial expressions of anger.

Although there has been research on associations between such macrosocial factors and parenting practices, for the most part, associations between macrosocial factors and children's emotional expressions have not been studied. This study examined the affective microsocial processes at work in mother-child interactions, shedding light on how macrosocial variables affect children's emotional expressions. Not only were macrosocial factors shown to be directly related to children's emotional expressions, but these factors were often related to children's emotional expressions via

their influence on maternal sensitivity. Specifically, this study found evidence that maternal supportive behavior and child-oriented motivation mediated the relations of maternal well-being factors to children's emotional expressions. Maternal supportive behavior also mediated the relations of family demographic factors to children's facial emotions.

Maternal Sensitivity Relations to Children's Emotions

The first objective of this study was to examine the direct relations between maternal sensitivity and children's expressions of emotions in mother-child interactions. The data revealed that children of mothers who demonstrated more supportive behavior or child-oriented motivation expressed more joy, less flat affect, and more sadness.

The findings that children of mothers who demonstrated more supportive behavior or child-oriented motivation expressed more joy are consistent with goal-oriented emotion theory. Infants process information about their present situation in relation to their goals and evaluate whether they are accomplishing their goals (Abe & Izard, 1999; Lazarus, 1991; Tronick, 1989). That is, when mothers demonstrated more supportive behavior, supporting children's wants and intentions during play interactions and tailoring children's immediate surroundings to help them achieve their intentions and wants, children may have expressed more joy because their mothers helped them accomplish their goals. Likewise, when mothers possessed child-oriented motivation, reporting that their own emotions were related to their concerns for how events affected their children, children may have expressed more joy because their mothers supported them in achieving their goals.

The findings related to joy can be understood as well by applying the reciprocal interaction perspective. Researchers have emphasized that in affectively well-regulated interactions, characterized by sensitive affective stimulation and arousal modulation, mothers and young children are affectively attuned to each other and experience mutually positive affect (e.g., joy) (Field, 1985; Tronick & Gianino, 1986; Stern, 1985). That is, affective coordination in well-regulated reciprocal interactions, characterized by maternal sensitivity, may maintain children's positive emotions, while miscoordination

may increase children's negativity. Thus, when mothers demonstrated supportive behavior or child-oriented motivation, positively facilitating an emotionally well-coordinated interaction, their children expressed more joy.

Although goal-oriented emotion theory and the reciprocal interaction perspective can explain why children expressed more joy when mothers demonstrated supportive behavior or child-oriented motivation, these views do not account for the findings that children of supportive or child-oriented mothers exhibited less flat affect and more sadness. Goal-oriented emotion theory and the reciprocal interaction perspective reflect the moment-to-moment nature of children's affective signaling in these interactions. However, children's emotional expressions could reflect the overall quality of the relationship between mother and child, rather than children's immediate affective responses to mothers' sensitivity in a given interaction.

Considering the history of contingency in mother-child interactions over time takes into account the overall quality of the relationship between mother and child and can be applied to interpret the findings that children of mothers who demonstrated more supportive behavior or child-oriented motivation expressed more joy, less flat affect, and more sadness. Children of supportive or child-oriented mothers may have learned over time that their mothers respond sensitively to their emotional signals. Thus, these children may send more emotional signals overall, positive and negative, to their mothers. In contrast, insensitive mothers may fail to respond contingently to children's emotional cues, abating or terminating children's expressions of emotion overtime. Insensitive mothers may also respond negatively to children's expressions of emotions, punishing emotional expression. As a result children may learn to suppress their emotions overtime. Consequently, if insensitive mothers respond noncontingently or negatively to children's emotional expressions children may become emotionally flat or non-communicative, expressing less emotion overall (Cohn & Tronick, 1983; Field, 1984; Field et al., 1989; Jameson et al., 1997). Emotion socialization research supports this idea by demonstrating that mothers provide feedback to their children regarding their emotional expressions, leading either to expression or suppression of certain

emotions (see Garner, 1996; Malatesta & Haviland, 1982). Therefore, supportive or child-oriented mothers may teach children to express emotion, including sadness, while insensitive mothers may teach children to forgo or suppress their emotional expressions.

Although not measured in this study, considering child attachment security may be another way to interpret the findings that children of supportive or child-oriented mothers expressed more joy, less flat affect, and more sadness. Like the history of contingency approach, attachment theory suggests that children's emotions could reflect the overall quality of the mother-child relationship, rather than children's immediate responses to maternal sensitivity in particular interactions. The association between maternal sensitivity and child attachment security is central to attachment theory; maternal sensitivity is a significant predictor of attachment (Ainsworth, Blehar, Waters, & Wall, 1978). Sensitive mothers provide their children with interactive experiences that help children develop security in relationships with their mothers (Braungart-Rieker et al., 2001; Kivijaervi et al., 2001). Ainsworth et al. defined attachment as an emotional bond characterized by the display of a "full spectrum" of "strong emotion" (1978, p. 23). When children are securely attached, they may feel more secure in their expression of a full range of emotions with more sensitive mothers than insecurely attached children who may inhibit their emotional expressions with less sensitive mothers. This may be due to knowledge that their signals are likely to be met with the insensitivity characteristic of such mothers. Thus, it may be that children of mothers who demonstrated more supportive behavior or reported more child-oriented motivation are more securely attached to their sensitive mothers. As a result they may feel more security in expressing a full range of emotions including joy and sadness while demonstrating less flat affect.

Overall, goal-oriented emotion theory and the reciprocal interaction perspective do well in accounting for the findings that children of mothers who demonstrated more supportive behavior or child-oriented motivation expressed more joy. However, considering the history of contingency related to children's emotional expressions and children's attachments with their mothers not only account for these findings, but also

account for the findings that children of mothers who demonstrated more supportive behavior or reported more child-oriented motivation expressed less flat affect and more sadness. Therefore, approaches reflecting the overall quality of the mother-child relationship, as opposed to theories related to children's immediate responses to maternal sensitivity in particular interactions offer a more comprehensive account of why children's emotional expressions related to maternal sensitivity.

Maternal Sensitivity Mediating Relations of Maternal Well-Being to Children's Emotions

The second objective of this study was to examine the direct relations between maternal psychological well-being factors and children's expressions of emotions in mother-child interactions and to determine whether maternal sensitivity mediated these relations.

Maternal Depressive Symptoms

Mothers with more depressive symptoms had children who expressed low joy, low sadness, and high flat affect. Relations of maternal depressive symptoms to these child emotions were mediated by components of maternal sensitivity. The relations of depressive symptoms to both low joy and high flat affect were entirely mediated by maternal supportive behavior. Additionally, the relations of depressive symptoms to both high flat affect and low sadness were partially mediated by child-oriented motivation. That is, children of mothers with more depressive symptoms may have expressed low joy and high flat affect because their mothers displayed less supportive behavior, and children of mothers with more depressive symptoms may have demonstrated high flat affect and low sadness, in part, because their mothers possessed less child-oriented motivation.

According to goal-oriented emotion theory, children's expressions of low joy may be a sign that mothers with significant depressive symptoms failed to support children's immediate goals during play interactions. Specifically, low joy may indicate that often children did not like the way the interaction proceeded and that their depressive mothers, because they demonstrated less supportive behavior, did not sufficiently support their children's goals and needs. Likewise, the reciprocal interaction

perspective would suggest that children's low joy indicates that they may have experienced affective miscoordination and poorly regulated affective interaction characterized by less maternal supportive behavior. When depressive mothers demonstrated less supportive behavior, they have may failed to facilitate an affectively positive interaction, which may have led to children's low joy. However, goal-oriented emotion theory and the reciprocal interaction perspective do not account for the findings that the relation of depressive symptoms to high flat affect was entirely mediated by supportive behavior and the relation of depressive symptoms to low sadness was partially mediated by child-oriented motivation. Again, explanations that consider the overall quality of the relationship between mother and child maintain that children's emotional expressions reflect this relationship and are not simply immediate responses to mothers' behavior in interactions.

Examining the history of contingency in mother-child interactions accounts for the overall quality of the relationship between mother and child and can be applied to understand each of the findings related to maternal depressive symptoms. As discussed earlier, when mothers demonstrate unsupportive behavior or possess little child-oriented motivation, they may fail to respond contingently to children's emotional signals. As a result, children may abate or suppress their expressions of subsequent emotions, positive and negative. Overtime, children may demonstrate less joy, less sadness, and more flat affect, indications that such children may have become emotionally non-communicative or emotionally disengaged from such interactions. Becoming emotionally flat and non-communicative may demonstrate a form of learned helplessness. Children learn that their emotional expressions do not elicit sensitive maternal responses (Nolen-Hoeksema, et al., 1986; Peterson & Seligman, 1983; Seligman, 1975).

Applying attachment theory may also be useful for understanding the findings related to maternal depressive symptoms. Research has shown that maternal depressive symptoms interact with maternal sensitivity to predict attachment security in young children (Campbell, Brownell, Hungerford, Spieker, Mohan, & Blessing, 2004).

Children of mothers with depressive symptoms who demonstrate less supportive behavior or low child-oriented motivation may express low joy, low sadness, and high flat affect because they may have insecure attachment relationships with their mothers. Due to apprehensiveness that their depressive mothers and may respond with insensitivity to their emotional displays, such children may not possess sufficient security to express a full range of emotions (Ainsworth et al., 1978).

Genetic susceptibility cannot be ruled out as another explanation for each of the findings related to depressive symptoms. Although a genetics perspective would suggest that these children should express less joy and more flat affect, possibly indicating non-communicativeness or emotional detachment, a genetics view would suggest that they should also express more sadness, not less (Plomin & Stocker, 1989). Researchers have suggested that infants of depressed mothers show depressed behavior from birth (Field, 1992; 1984). Depressive symptoms have been linked to characteristic brain behavior patterns as measured by EEG, indicating that asymmetric hemisphere activity of the frontal regions of the brain may indicate a predisposition for depression (Field, Fox, Pickens, & Nawrocki, 1995; Jones, Field, Fox, Davalos, & Gomez, 2001) and depressive emotion (e.g., sadness). Specifically, greater right frontal EEG asymmetries due to suppressed left hemisphere activity are related to a depressive mood state, and such asymmetries have been noted in infants of depressed mothers as early as one week of age (see Jones et al., 2001). This suggests that frontal EEG may be useful markers for a predisposition to negative affect states (Field, 1995).

It may be possible that children of depressive insensitive mothers demonstrate a general dampening of affect where all emotions are blunted, including sadness. However, because there is no direct relationship between maternal depressive symptoms and children's emotions, a direct genetic link between maternal depressive symptoms and children's emotions cannot be assumed. Although not disproving a genetics explanation, these mediational findings suggest that children's emotion is contingent upon maternal sensitivity or insensitivity. Children may not simply possess a genetic predisposition to express certain emotions, but they may be genetically sensitive

to reacting to stressful environments likely to be present in interactions with depressed or depressive mothers (see Jameson et al., 1997). This represents a general adaptation system that acts to mobilize children's emotions (or emotional detachment) in certain stress-inducing environments. It is this genetic predisposition coupled with an environmental situation (e.g., maternal insensitivity) that triggers genes responsible for such an emotional response to turn on. Thus, when children of depressive mothers are exposed to insensitive maternal behavior, they may be genetically more likely to demonstrate high flat affect and low sadness, becoming emotionally non-communicative.

Again, approaches reflecting the overall quality of the mother-child relationship (i.e., history of contingency and attachment theory) as opposed to theories related to children's immediate responses to maternal sensitivity in particular interactions (i.e., goal-oriented emotion theory and the reciprocal interaction perspective) are more comprehensive in accounting for children's emotional expressions related to depressive mothers' insensitivity. Specifically, goal-oriented emotion theory and the reciprocal interaction perspective accounted for the finding that relations of depressive symptoms to both low joy and high flat affect were entirely mediated by maternal supportive behavior and the finding that the relation of depressive symptoms to high flat affect was partially mediated by child-oriented motivation. However, these approaches do not account well for the finding that the relation of depressive symptoms to low sadness was partially mediated by child-oriented motivation. Considering the history of contingency in mother-child interactions and children's attachment relationships, however, can account for this finding. The idea that there might be a genetic influence on children's emotional expression should also be given consideration.

Marital Satisfaction

Mothers with greater marital satisfaction had children who expressed low flat affect and high anger. The unexpected direct relation between greater marital satisfaction and more anger is discussed later in this paper. The relation of marital satisfaction to low flat affect was entirely mediated by maternal supportive behavior.

That is, children of mothers high in marital satisfaction may have expressed less flat affect because their mothers displayed more supportive behavior. This finding supports the hypothesis that marital satisfaction may serve to bolster maternal competence or sensitivity (Belsky, 1984; see Shek, 1998), leading to microanalytic changes in children's emotions (e.g., low flat affect).

In line with this mediational finding, the spillover hypothesis maintains that the quality of parent-child relationships and interactions, and children's emotional well-being, in turn, are affected by parents' marital quality (Belsky, 1981, 1990; Emery, et al., 1984; Engfer, 1988). When parents are dissatisfied with their marriages, this may "spill over" into the parent-child relationship. It may affect parental behavior towards their children, negatively affecting children's psychological or emotional well-being (Erel & Burman, 1995) and the emotions they express. Conversely, when parents are satisfied with their marriages, it may benefit the parent-child relationship and positively affect children's emotional states and the emotions they express. Shek (1998) explains that the spillover hypothesis is supported by research showing that parents with poor marriages are less competent and demonstrate hostile, insensitive, inconsistent, and ineffective parenting behavior (Dielman, Barton, & Cattell, 1977; Easterbrooks & Emde, 1988; Fauber, Forehead, Thomas, & Wierson, 1990; Hess & Camara, 1979; Stoneman et al., 1989). Similarly, research shows that marital satisfaction and harmony are associated with less strict and more supportive parental attitudes and fewer feelings of irritation toward children (Goldberg & Easterbrooks, 1984) and related to sensitivity and warmth toward infants in play interactions (Cox et al., 1989). The findings of this study were consistent with the spillover hypothesis and demonstrated mechanisms by which mothers' marital satisfaction affects children's affective experiences when interacting with their mothers. That is, when mothers experienced marital satisfaction, their satisfaction may have "spilled over" into their relationships with their children, resulting in more supportive behavior with their children. In turn, their children showed less flat affect, an indication that they were not emotionally disengaged but rather open to emotional communication with their mothers.

Maternal Social Support

Mothers with more social support had children who expressed more anger. Like that for marital satisfaction, this unexpected direct relation between greater maternal social support and more anger is discussed later in this paper. There was no evidence of mediation in relation to social support. Social support was unrelated to all three of the maternal sensitivity components, thus mediational analyses were precluded. However, other research has provided evidence showing a relationship between social support and sensitive, responsive parenting (Andreson & Telleen, 1992; Colletta, 1979; Crnic et al., 1983; Crockenberg, 1981; Goldstein, Diener, & Mangelsdorf, 1996; Jennings et al., 1991). There may have been shortcomings with regard to the methods that are responsible for these lack of relations. The Support Questionnaire is a well-validated, widely used measure of social support, so a social support measurement problem is not likely present. However, one issue may be that maternal sensitivity components were assessed during either 10- or 20-minute interactions, providing a limited behavioral sample. A larger timeframe to assess maternal sensitivity may be required if associations between social support and maternal sensitivity are modest. Furthermore, social support may only affect parenting or children's emotions under certain circumstances.

Maternal Sensitivity Mediating Relations of Family Demographics to Children's Emotions

The third objective of this study was both to examine the direct relations between family demographic factors and children's expressions of emotions in mother-child interactions and to determine whether maternal sensitivity mediated these associations.

Family Socioeconomic Status

SES was directly related to child joy. However, there was no evidence that maternal sensitivity mediated relations between SES and child joy (SES was unrelated to all three of the maternal sensitivity components). The direct association showed that families with high SES had children who expressed more joy. Theoretically, two perspectives have been considered when examining how family factors (e.g., economic

or environmental stressors) influence children's development and emotional well-being (Linver, Brooks-Gunn, & Kohen, 2002), family stress models and investment models (Conger & Elder, 1994; Conger, Rueter, & Elder, 1999; Haveman & Wolfe, 1994). Linver et al. (2002) explain that family stress models maintain that factors related to SES (e.g., neighborhood safety, school or childcare quality, healthcare, etc.) influence children's development and well-being through their impact on parents' mental health, which influence parenting practices and, in turn, are related to children's well-being (Conger et al., 1992; Elder & Caspi, 1988; McLoyd, 1989). Linver et al. (2002) also explain that investment models postulate that higher SES is associated with children's development and well-being because factors related to higher SES (e.g., higher income, access to better services for children, a more cognitively stimulating home environment) enable parents to purchase and access materials, experiences, and goods that directly benefit children and invest in the human capital of their children (Becker & Thomas, 1986; Haveman & Wolfe, 1994; Mayer, 1997). Because SES was directly related to child joy, unmediated by maternal sensitivity, an investment model may better account for this association than a family stress model.

Whereas a stress model suggests that lower SES parents are exposed to various stressors that impact their parenting practices, including sensitivity, an investment model suggests that environmental stressors related to low SES directly affect children and their emotional well-being. In line with an investment model, higher SES affords individuals benefits and protective factors from stressors; thus, environmental provisions may mediate the relationship between high SES and children's joy. Research has shown that a cognitively stimulating home environment, one construct of investment, mediated the association between family income, a component of SES, and child development outcomes (Linver et al., 2002). It may be that children's positive emotional states are also affected by the goods and experiences afforded by their family's SES and the related environments in which they live. It has also been shown that SES directly impacts adults' emotions. Gallo and Matthews (2003) developed a model conceptualizing relations between SES and emotion. They assert that lower SES

environments foster greater exposure to stress, which, in turn, elicits more negative emotion. Similarly, individuals of higher SES may demonstrate more joy, because they are exposed to less stress and more protective factors. It may be that SES, which children share with their mothers, directly affects children's emotions as well. Thus, a child's exposure to provisions afforded by higher SES may be responsible for their expressions of joy.

Another way to understand this finding is to consider a process of affect contagion. That is, in social interactions, one individual may become "infected" with the emotions displayed by the partner. SES may directly impact mothers' emotions (Gallo & Matthews, 2003), which may affect children's emotions, in turn. For example, if a child sees her mother express joy, she may also feel and become joyful, interpreting the "emotional meaning" of joy (see Saarni, Mumme, & Campos, 1998; Wild, Erb, & Bartels, 2001). Through a process of affect contagion, higher SES mothers who express more joy have children who express more joy as well.

Maternal Education

Higher maternal education was directly related to low sadness and low anger in children. These findings can be interpreted from an investment model view. Children may experience less negative emotion, in part, because their mothers are able to provide more human capital to their children. Education affords parents the ability to provide their children with greater provisions and enriched environments (Menaghan & Parcel, 1991). For example, "increases in education presumably improve parents' perspectives on their lives, enhance their own cognitive and literacy skills, and may spill over to increased feelings of mastery and competence. . ." (Bornstein et al., 2003, p. 69). If children with mothers with greater educational attainment are exposed to generally more enriched environments with parents who view themselves as more competent and efficacious, children's emotional well-being may directly benefit. Thus, provisions related to higher maternal education may lead to low expressions of child sadness and anger.

In addition to these direct findings, the relation of maternal education to joy was partially mediated by maternal supportive behavior. Children of mothers with high education may have expressed more joy, in part, because their mothers displayed more supportive behavior. Higher maternal education is associated with more knowledge of parenting and child development (see Bornstein et al., 2003). This may lead to competent parenting practices and sensitivity and, in turn, to children's expression of joy. Conversely, low maternal education is related to mothers' inability to effectively or sensitively parent (Gottfried & Gottfried, 1984), leading to less sensitivity and low child joy, in turn. Research has shown that although maternal education is associated with some infant behaviors, maternal education relates to those infant behaviors only indirectly through maternal behaviors (e.g., sensitivity); "proximal maternal behaviors were better predictors of infant behaviors than were distal sociodemographic indicators, including maternal education" (Bornstein et al., 2003, p. 69). Thus, this study shows that one mechanism by which children of mothers with higher educations, and likely more knowledge of competent parenting practices, express more joy when interacting may, in part, be because their mothers demonstrate more supportive behavior.

Family Income

The relation of income to joy was entirely mediated by maternal supportive behavior. Children of families with high incomes may have expressed more joy because their mothers displayed more supportive behavior. Research shows that mothers of families with higher incomes demonstrate more sensitive, responsive and effective parenting practices than lower income parents (e.g., see Kim-Cohen et al., 2004; McLoyd & Wilson, 1994; Raver, 1996). Additionally, higher incomes are less likely to be associated with negativism in children, as compared to children from families with lower incomes (Elder, 1979; Elder et al., 1984; Elder et al., 1985). As such, previous studies have shown that higher incomes are associated with more global measures of sensitivity and children's global emotionality. However, this study sheds light on a process by which income relates to children's emotions. That is, maternal sensitivity, specifically supportive behavior, among higher income mothers may affect children's

expressions of joy. Family stress models suggest that mothers in families with higher incomes are less stressed than those in families with lower incomes, and thus do not transfer such stress onto their children by becoming insensitive with their children. Rather higher incomes and less stress lead to mothers' supportive behavior with their children. In turn, their children express more joy. Thus, this study demonstrates that income may affect mothers' sensitive behavior, and, thus, emotional expressions of their children.

Additional Considerations

Child Anger

Although, as predicted, higher maternal education was related to low child anger, three findings related to child anger were unexpected and difficult to interpret. One unexpected finding showed that when mothers were more autonomy granting, their children expressed more, not less anger. Additionally, although maternal sensitivity did not mediate the associations between child anger and either marital satisfaction or social support, marital satisfaction and social support were both related to more child anger, unexpectedly. Because child anger is associated with sensitive parenting and protective macrosocial variables, we may be able to assume that child anger, usually considered a negative property of children's emotional expression, might represent healthy emotional expressiveness.

Research has shown that positive, sensitive maternal behavior within control encounters with two to four year olds can induce and maintain child anger and distress (Dowdney & Pickles, 1991). The researchers explain that maternal sensitive behavior may influence child anger in two ways: an angry, distressed child may find maternal positivity or amusement upsetting, which prolongs their anger or, if a mother adopts a warm, sensitive style while opposing or attempting to control the child, the child may be receiving a frustrating mixed message (Dowdney & Pickles, 1991, p. 615). Alternatively, anger may represent children's healthy defiance. Researchers have found that in response to maternal control, children between the ages of 14 and 27 months

demonstrate negative self-assertive displays that are related to maternal sensitivity and positive mother-child interaction (Dix, Stewart, Gershoff, & Day, 2007). Children who demonstrate such defiant behavior likely exhibit concomitant expressions of anger. Dix et al. (2007) point out that such findings are consistent with theories that emphasize children's desire for autonomy and control that develops at this age (see Crockenberg & Litman, 1990; Erikson, 1968; Kopp, 1982). Another possible explanation for why children of autonomy granting mothers express more anger may be that expressing anger is a learned behavior (Dix et al., 2007). Children may learn to suppress the expression of anger with mothers who do not demonstrate autonomy granting behavior and who stifle or punish angry expressions.

Bidirectionality and Causality

It is also important to understand that this study did not determine causal relationships among maternal sensitivity components, macrosocial factors, and children's emotions. Rather, results yielded correlations among variables Theoretical models of parent-child interaction and transactional models of development suggest bidirectionality of emotional exchange (Fogel, 1990; Gianino & Tronick, 1988; Isabella & Belsky, 1991; Stern, 1985). These views consider the role of children's emotions as key predictors of mothers' behavior. Mothers may behave more sensitively with their children because their children express more joy or less flat affect. They may feel more positively connected to children who express positive emotion and less flat affect and respond accordingly in a warm, sensitive manner. Child sadness may also lead mothers to behave sensitively toward their children. For example, sadness may show that a child's goal has not yet been met during the interaction and may communicate the child's disappointment and a desire for sensitive maternal behavior to help achieve the child's goal. Sadness elicits empathy and helping behavior, which are important because young children are relatively helpless and depend on others (see Abe & Izard, 1999).

Sequential analyses may have revealed causal relationships between variables; however, sequential analyses do not test non-sequential or relationship-oriented

hypotheses. That is, maternal sensitivity is likely related to children's emotions more globally, affecting children's emotions over time and leading to a general tendency for children to become less positive and/or more negative over an entire interaction, day, or week. For example, a child may learn to expect her mother's insensitive behavior and develop a general tendency to be affectively flat, because she is reacting to a set of stored representations of her mother as an insensitive partner. Although sequential tests may reveal that maternal sensitivity/insensitivity causes particular child emotions from moment-to-moment, employing sequential analysis to analyze single interactions may not reveal whether interacting with sensitive/insensitive mothers leads to particular child emotions over time.

Limitations and Future Directions

Although this study addressed a gap in the research on predictors of children's emotions, future research is needed to confirm and extend the current findings. This study did not assess the long-term effects of children's emotions on their later well-being and development. Children's emotions are correlates of developmental outcomes and may reveal how children are functioning and developing over time. Longitudinal studies are needed to understand and assess the impacts of children's emotional expressions, when interacting with mothers who possess certain risk and protective factors, on their future developmental outcomes.

The sample has limitations. Mothers in this study were not clinically depressed, and I have no knowledge of the chronicity of their depression. Therefore, the findings cannot be applied to a clinically depressed sample. It is also important to point out that a larger sample may have yielded more significant findings. Future studies should consider replicating and extending this research using a larger sample to increase statistical power. Additionally, findings were limited because participants represented a particular cultural group, a primarily white, middle class, US sample. Display rules and cultural differences exist in the extent to which children are permitted or encouraged to express certain emotions, so results may not be generalizable to other cultural groups. Among Gusii, an agricultural community in Western Kenya, mothers look away from

their infants at the moment their infants become the most emotionally positive and excited in order to socialize later restriction on positive emotions when in the presence of elders, for example (Keefer, Tronick, Dixon, & Brazelton, 1982). Further, Asian values, which have been described as collectivist, interdependent, and highly value relationship harmony and respect for authority, discourage anger expressions. However, in the US, priorities focus on individuality, autonomy, and self-expression, tolerating anger in the interest of self-assertion and freedom (see Cole, Bruschi, &Tamang, 2002). Future studies on predictors of children's emotions should address these limitations.

Conclusion

This study contributed to research on children's emotional expression with mothers by examining how multiple measures of maternal sensitivity were directly related to children's facial emotions and how maternal sensitivity mediated the relations between macrosocial maternal factors and children's facial emotions. It was shown that two different measures of maternal sensitivity, supportive behavior and child-oriented motivation, directly predicted more facial expressions of joy and sadness and less flat affect in children. Maternal autonomy granting unexpectedly predicted more facial expressions of anger in children. It was also found that high maternal education was directly related to fewer facial expressions of sadness and anger, high SES was related to more facial expressions of joy, and both greater marital satisfaction and social support were unexpectedly related to more facial expressions of anger. Results also demonstrated that supportive behavior mediated associations between: maternal depressive symptoms and both low joy and high flat affect, marital satisfaction and low flat affect, maternal education and high joy, and family income and high joy. Child-oriented motivation mediated associations between maternal depressive symptoms and both high flat affect and low sadness. Findings suggest that it is important to consider multiple measures of maternal sensitivity and the broader macrosocial context in which the parent-child relationship is embedded when examining children's facial expressions of emotion in mother-child interactions. Additionally, children's emotional expressions function as microsocial mechanisms by which important macrosocial variables relate to mother-child interactions. Finally, it is important to study children's emotional expressions, because they may be correlates of developmental outcomes and may reveal how children are functioning over time.

Table 1

Descriptive Statistics for Child Emotions, Maternal Sensitivity, Maternal Psychological Well-Being, and Family Demographic Variables

		Mean	SD	Range
Child Emotions				
Joy	%	.161	.100	.01-.53
	#	20.74	15.56	1-65
Flat Affect	%	.67	.140	0-1
	#	78.03	26.10	35-181
Sadness	%	.011	.026	.00-.16
	#	1.23	2.70	0-15
Anger	%	.012	.021	.00-.09
	#	1.43	2.55	0-13
Maternal Sensitivity Measures				
Supportive Behavior	%	.749	.084	.53-.91
Child-Oriented Motivation	%	.447	.146	.09-.82
	#	11.99	6.44	2-30
Autonomy Granting	%	.097	.067	.00-.35
	#	7.30	6.10	0-30
Maternal Psychological Well-Being				
Depressive Symptoms [a]		30.51	7.89	20-59
Social Support		4.98	.788	2.48-6.00
Marital Satisfaction		5.46	1.19	1.80-6.95
Family Demographics				
SES		42.75	11.18	17-66
Income		5.16	1.99	0-9
Maternal Education		13.96	2.12	10-19

Note. The symbol # refers to the frequency or number of behaviors, % to the percentage of behaviors. Percentages for child emotions had a denominator equal that of all child emotions expressed; thus, the noted percentages do not add up to 100%.

[a] Depression scores reflect the sum of all CES-D items. All items were scored using a 1-4 scale, rather than a 0-3 scale.

Table 2

Relations Among Child Emotions

	Joy	**Flat Affect**	**Sadness**	**Anger**
Joy				
Flat Affect	-3.10*** (.168)			
Sadness	-1.13 (.996)	-1.01* (.511)		
Anger	-12.18*** (1.47)	.170 (.570)	23.60*** (2.91)	

Note. Coefficients are unstandardized regression coefficients (with standard errors in parentheses). Child emotions in columns were entered as dependent variables and child emotions in rows entered as independent variables.

* $p < .05$. *** $p < .001$.

Table 3

Relations of Maternal Sensitivity Measures to Child Emotions

	Child Emotions			
Maternal Sensitivity Measures	Joy	Flat Affect	Sadness	Anger
Supportive Behavior				
with controls	2.33***	-.786***	4.00*	.059
	(.359)	(.176)	(1.61)	(1.36)
without controls	2.09***	-.698***	2.59*	-2.32*
	(.289)	(.138)	(1.18)	(.970)
Autonomy Granting				
with controls	-.352	-.188	.575	3.15**
	(.354)	(.178)	(1.31)	(1.20)
without controls	-.521	-.166	1.67	
	(.337)	(.170)	(1.25)	3.78***
				(1.08)
Child-Oriented Motivation				
with controls	.524**	-.355***	3.07***	-.084
	(.177)	(.091)	(.786)	(.694)
without controls	.611***	-.345***	1.64*	-.227
	(.159)	(.082)	(.655)	(.606)

Note. Coefficients are unstandardized regression coefficients for maternal sensitivity measures predicting child emotions (with standard errors in parentheses). Child variables entered as controls: child age, child sex, child temperament.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 4

Relations of Depressive Symptoms to Maternal Sensitivity Measures and to Child Emotions (with Maternal Sensitivity Measures Included as Potential Mediators)

Relations with Depressive Symptoms	B	SE	*p*	Sobel Test	*p*
Sensitivity Measures (Potential Mediators)					
Supportive Behavior	-.004	.001	.002		
Child-Oriented Motivation	-.007	.002	.001		
Autonomy Granting	-.001	.001	.263		
Emotions (Direct and Indirect)					
Joy	-.016	.004	.000		
Joy with Supportive Behavior	-.005	.004	.235		
Supportive Behavior to Joy	2.16	.385	.000	-2.83	.005
Joy with Child-Oriented Motivation	-.015	.004	.000		
Child-Oriented Motivation to Joy	.276	.187	.140		
Joy with Autonomy Granting	-.016	.004	.000		
Autonomy Granting to Joy	-.547	.360	.129		
Flat Affect	.007	.002	.000		
Flat affect with Supportive Behavior	.003	.002	.135		
Supportive Behavior to Flat affect	-.684	.189	.000	2.43	.015
Flat affect with Child-Oriented Motivation	.005	.002	.002		
Child-Oriented Motivation to Flat affect	-.260	.097	.007	2.10	.036
Flat affect with Autonomy Granting	.007	.002	.000		
Autonomy Granting to Flat affect	-.114	.179	.525		
Sadness	-.068	.018	.000		
Sadness with Supportive Behavior	-.081	.019	.000		
Supportive Behavior to Sadness	1.92	1.74	.270		
Sadness with Child-Oriented Motivation	-.053	.019	.006		
Child-Oriented Motivation to Sadness	2.08	.831	.012	-2.00	.045
Sadness with Autonomy Granting	-.069	.018	.000		
Autonomy Granting to Sadness	-.179	1.39	.897		
Anger	-.021	.013	.124		
Anger with Supportive Behavior	-.023	.014	.106		
Supportive Behavior to Anger	-.676	1.43	.637		
Anger with Child-Oriented Motivation	-.026	.015	.079		
Child-Oriented Motivation to Anger	-.653	.766	.394		
Anger with Autonomy Granting	-.017	.014	.215		
Autonomy Granting to Anger	2.94	1.21	.015		

Note. Coefficients are unstandardized regression coefficients for relations of depressive symptoms to maternal sensitivity measures and child emotions (both directly and indirectly with maternal sensitivity measures as potential mediators). Child variables entered as controls: child age, child sex, child temperament. If criteria for mediation were met, the Sobel test determined whether the sensitivity measure significantly carried the influence of depressive symptoms to child emotions.

Table 5

Relations of Marital Satisfaction to Maternal Sensitivity Measures and to Child Emotions (with Maternal Sensitivity Measures Included as Potential Mediators)

Relations with Marital Satisfaction:	B	SE	*p*	Sobel Test	*p*
Sensitivity Measures (Potential Mediators)					
Supportive Behavior	.019	.007	.007		
Child-Oriented Motivation	.016	.013	.230		
Autonomy Granting	.007	.007	.287		
Emotions (Direct and Indirect)					
Joy	.033	.020	.110		
Joy with Supportive Behavior	.005	.023	.823		
Supportive Behavior to Joy	2.30	.380	.000		
Joy with Child-Oriented Motivation	.026	.020	.203		
Child-Oriented Motivation to Joy	.497	.178	.005		
Joy with Autonomy Granting	.034	.021	.098		
Autonomy Granting to Joy	-.441	.359	.220		
Flat Affect	-.022	.011	.035		
Flat affect with Supportive Behavior	-.019	.012	.109		
Supportive Behavior to Flat affect	-.691	.186	.000	-2.23	.026
Flat affect with Child-Oriented Motivation	-.019	.011	.072		
Child-Oriented Motivation to Flat affect	-.342	.091	.000		
Flat affect with Autonomy Granting	-.020	.011	.067		
Autonomy Granting to Flat affect	-.145	.179	.418		
Sadness	.109	.083	.191		
Sadness with Supportive Behavior	-.140	.102	.170		
Supportive Behavior to Sadness	4.81	1.71	.005		
Sadness with Child-Oriented Motivation	.070	.081	.385		
Child-Oriented Motivation to Sadness	2.98	.789	.000		
Sadness with Autonomy Granting	.107	.085	.208		
Autonomy Granting to Sadness	.149	1.37	.914		
Anger	.186	.092	.043		
Anger with Supportive Behavior	.166	.094	.079		
Supportive Behavior to Anger	-.634	1.42	.656		
Anger with Child-Oriented Motivation	.190	.092	.040		
Child-Oriented Motivation to Anger	-.274	.698	.695		
Anger with Autonomy Granting	.148	.091	.103		
Autonomy Granting to Anger	2.73	1.23	.026		

Note. Coefficients are unstandardized regression coefficients for relations of marital satisfaction to maternal sensitivity measures and child emotions (both directly and indirectly with maternal sensitivity measures as potential mediators). Child variables entered as controls: child age, child sex, child temperament. If criteria for mediation were met, the Sobel test determined whether the sensitivity measure significantly carried the influence of marital satisfaction to child emotions.

Table 6

Relations of Social Support to Maternal Sensitivity Measures and to Child Emotions (with Maternal Sensitivity Measures Included as Potential Mediators)

Relations with Social Support:	B	SE	*p*	Sobel Test	*p*
Sensitivity Measures (Potential Mediators)					
Supportive Behavior	.016	.012	.187		
Child-Oriented Motivation	-.000	.022	.967		
Autonomy Granting	.014	.010	.187		
Emotions (Direct and Indirect)					
Joy	-.027	.032	.391		
Joy with Supportive Behavior	-.043	.036	.236		
Supportive Behavior to Joy	2.39	.371	.000		
Joy with Child-Oriented Motivation	-.028	.032	.379		
Child-Oriented Motivation to Joy	.408	.032	.025		
Joy with Autonomy Granting	-.028	.032	.386		
Autonomy Granting to Joy	.283	.367	.441		
Flat Affect	-.007	.017	.689		
Flat affect with Supportive Behavior	-.017	.019	.355		
Supportive Behavior to Flat affect	-.713	.180	.000		
Flat affect with Child-Oriented Motivation	-.010	.017	.535		
Child-Oriented Motivation to Flat affect	-.387	.093	.000		
Flat affect with Autonomy Granting	-.007	.017	.696		
Autonomy Granting to Flat affect	-.182	.189	.336		
Sadness	.163	.123	.182		
Sadness with Supportive Behavior	-.166	.142	.242		
Supportive Behavior to Sadness	3.99	1.70	.019		
Sadness with Child-Oriented Motivation	.130	.122	.288		
Child-Oriented Motivation to Sadness	4.02	.868	.000		
Sadness with Autonomy Granting	.201	.132	.129		
Autonomy Granting to Sadness	-1.43	1.50	.338		
Anger	.482	.159	.002		
Anger with Supportive Behavior	.430	.167	.010		
Supportive Behavior to Anger	-1.42	1.46	.332		
Anger with Child-Oriented Motivation	.499	.160	.002		
Child-Oriented Motivation to Anger	1.36	.778	.079		
Anger with Autonomy Granting	.476	.165	.004		
Autonomy Granting to Anger	-.455	1.42	.748		

Note. Coefficients are unstandardized regression coefficients for relations of social support to maternal sensitivity measures and child emotions (both directly and indirectly with maternal sensitivity measures as potential mediators). Child variables entered as controls: child age, child sex, child temperament. If criteria for mediation were met, the Sobel test determined whether the sensitivity measure significantly carried the influence of social support to child emotions.

Table 7

Relations of SES to Maternal Sensitivity Measures and to Child Emotions (with Maternal Sensitivity Measures Included as Potential Mediators)

Relations with SES:	B	SE	*p*	Sobel Test	*p*
Sensitivity Measures (Potential Mediators)					
Supportive Behavior	.001	.001	.092		
Child-Oriented Motivation	.003	.001	.085		
Autonomy Granting	.001	.001	.070		
Emotions (Direct and Indirect)					
Joy	.006	.002	.011		
Joy with Supportive Behavior	.002	.002	.422		
Supportive Behavior to Joy	2.29	.375	.000		
Joy with Child-Oriented Motivation	.004	.002	.054		
Child-Oriented Motivation to Joy	.438	.002	.016		
Joy with Autonomy Granting	.005	.002	.024		
Autonomy Granting to Joy	-.509	.364	.161		
Flat Affect	.001	.001	.648		
Flat affect with Supportive Behavior	.002	.001	.051		
Supportive Behavior to Flat affect	-.890	.182	.000		
Flat affect with Child-Oriented Motivation	.002	.001	.166		
Child-Oriented Motivation to Flat affect	-.382	.001	.000		
Flat affect with Autonomy Granting	.002	.001	.123		
Autonomy Granting to Flat affect	-.255	.183	.162		
Sadness	-.003	.009	.743		
Sadness with Supportive Behavior	-.014	.010	.171		
Supportive Behavior to Sadness	4.98	1.71	.004		
Sadness with Child-Oriented Motivation	-.015	.009	.122		
Child-Oriented Motivation to Sadness	3.37	.827	.000		
Sadness with Autonomy Granting	-.002	.010	.844		
Autonomy Granting to Sadness	.790	1.37	.564		
Anger	-.010	.009	.265		
Anger with Supportive Behavior	-.009	.009	.304		
Supportive Behavior to Anger	.757	1.45	.601		
Anger with Child-Oriented Motivation	-.009	.009	.273		
Child-Oriented Motivation to Anger	-.035	.699	.960		
Anger with Autonomy Granting	-.011	.009	.226		
Autonomy Granting to Anger	3.46	1.20	.004		

Note. Coefficients are unstandardized regression coefficients for relations of SES to maternal sensitivity measures and child emotions (both directly and indirectly with maternal sensitivity measures as potential mediators). Child variables entered as controls: child age, child sex, child temperament. If criteria for mediation were met, the Sobel test determined whether the sensitivity measure significantly carried the influence of SES to child emotions.

Table 8

Relations of Maternal Education to Maternal Sensitivity Measures and to Child Emotions (with Maternal Sensitivity Measures Included as Potential Mediators)

Relations with Maternal Education:	B	SE	*p*	Sobel Test	*p*
Sensitivity Measures (Potential Mediators)					
Supportive Behavior	.009	.004	.031		
Child-Oriented Motivation	.006	.008	.419		
Autonomy Granting	.006	.004	.144		
Emotions (Direct and Indirect)					
Joy	.064	.012	.000		
Joy with Supportive Behavior	.055	.013	.000		
Supportive Behavior to Joy	1.91	.370	.000	2.03	.042
Joy with Child-Oriented Motivation	.060	.012	.000		
Child-Oriented Motivation to Joy	.401	.177	.024		
Joy with Autonomy Granting	.067	.012	.000		
Autonomy Granting to Joy	-.718	.364	.049		
Flat Affect	.002	.006	.773		
Flat affect with Supportive Behavior	.008	.007	.215		
Supportive Behavior to Flat affect	-.844	.182	.000		
Flat affect with Child-Oriented Motivation	.005	.006	.447		
Child-Oriented Motivation to Flat affect	-.363	.092	.000		
Flat affect with Autonomy Granting	.006	.006	.386		
Autonomy Granting to Flat affect	-.212	.180	.240		
Sadness	-.155	.053	.003		
Sadness with Supportive Behavior	-.248	.058	.000		
Supportive Behavior to Sadness	5.99	.058	.001		
Sadness with Child-Oriented Motivation	-.176	.053	.001		
Child-Oriented Motivation to Sadness	3.48	.829	.000		
Sadness with Autonomy Granting	-.166	.055	.003		
Autonomy Granting to Sadness	1.73	1.35	.200		
Anger	-.145	.049	.003		
Anger with Supportive Behavior	-.160	.051	.002		
Supportive Behavior to Anger	1.18	1.42	.405		
Anger with Child-Oriented Motivation	-.146	.049	.003		
Child-Oriented Motivation to Anger	.080	.709	.910		
Anger with Autonomy Granting	-.150	.050	.003		
Autonomy Granting to Anger	3.46	1.20	.004		

Note. Coefficients are unstandardized regression coefficients for relations of maternal education to maternal sensitivity measures and child emotions (both directly and indirectly with maternal sensitivity measures as potential mediators). Child variables entered as controls: child age, child sex, child temperament. If criteria for mediation were met, the Sobel test determined whether the sensitivity measure significantly carried the influence of maternal education to child emotions.

Table 9

Relations of Income to Maternal Sensitivity Measures and to Child Emotions (with Maternal Sensitivity Measures Included as Potential Mediators)

Relations with Income:	B	SE	*p*	Sobel Test	*p*
Sensitivity Measures (Potential Mediators)					
Supportive Behavior	.010	.004	.013		
Child-Oriented Motivation	.009	.008	.263		
Autonomy Granting	.007	.005	.085		
Emotions (Direct and Indirect)					
Joy	.031	.013	.019		
Joy with Supportive Behavior	.006	.014	.678		
Supportive Behavior to Joy	2.27	.381	.000	2.34	.019
Joy with Child-Oriented Motivation	.027	.013	.039		
Child-Oriented Motivation to Joy	.485	.178	.006		
Joy with Autonomy Granting	.032	.014	.017		
Autonomy Granting to Joy	-.528	.363	.146		
Flat Affect	-.004	.007	.508		
Flat affect with Supportive Behavior	.005	.007	.488		
Supportive Behavior to Flat affect	-.825	.185	.000		
Flat affect with Child-Oriented Motivation	-.002	.007	.762		
Child-Oriented Motivation to Flat affect	-.353	.091	.000		
Flat affect with Autonomy Granting	-.001	.007	.842		
Autonomy Granting to Flat affect	-.182	.007	.316		
Sadness	.026	.052	.612		
Sadness with Supportive Behavior	-.028	.055	.607		
Supportive Behavior to Sadness	4.26	1.69	.012		
Sadness with Child-Oriented Motivation	-.008	.051	.872		
Child-Oriented Motivation to Sadness	3.09	.796	.000		
Sadness with Autonomy Granting	.026	.054	.621		
Autonomy Granting to Sadness	.403	1.36	.767		
Anger	-.036	.052	.494		
Anger with Supportive Behavior	-.037	.055	.500		
Supportive Behavior to Anger	.413	1.47	.778		
Anger with Child-Oriented Motivation	-.035	.052	.500		
Child-Oriented Motivation to Anger	-.039	.696	.955		
Anger with Autonomy Granting	-.057	.054	.289		
Autonomy Granting to Anger	3.39	1.21	.005		

Note. Coefficients are unstandardized regression coefficients for relations of income to maternal sensitivity measures and child emotions (both directly and indirectly with maternal sensitivity measures as potential mediators). Child variables entered as controls: child age, child sex, child temperament. If criteria for mediation were met, the Sobel test determined whether the sensitivity measure significantly carried the influence of income to child emotions.

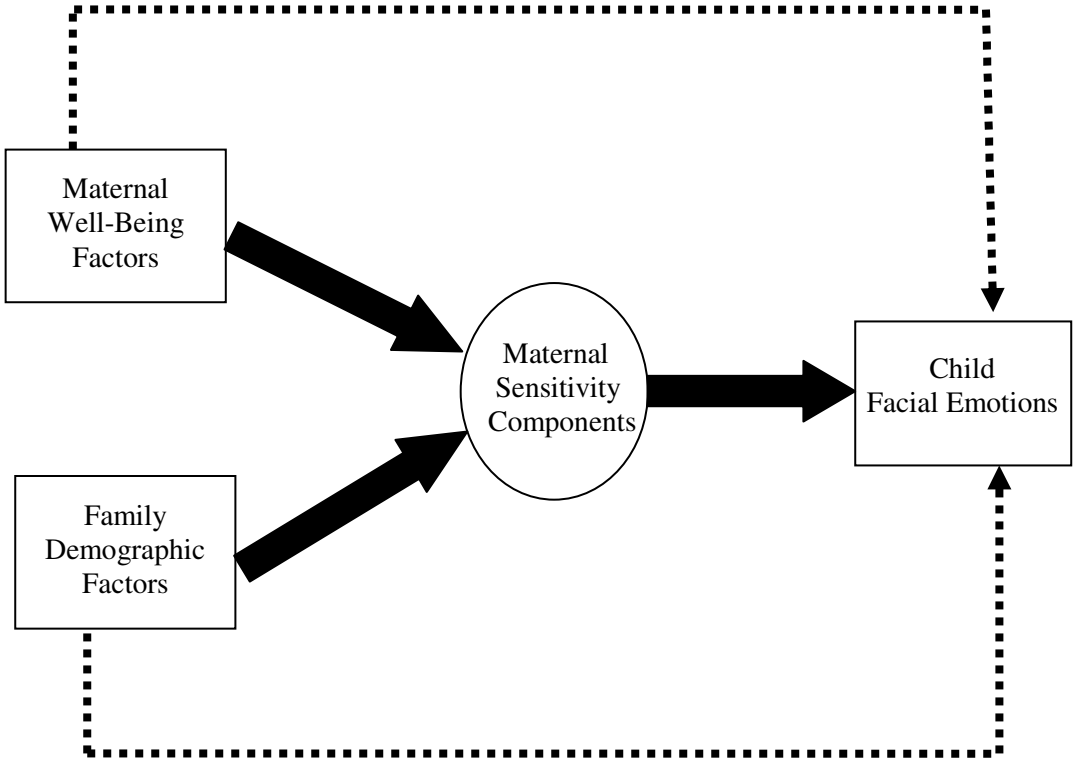

Figure 1. A process model of the predictors of children's facial emotion in mother-child interactions

Appendix A: Supportive Behavior Code

The Supportive Behavior Code measures the extent to which mothers are interacting with young children in ways that are connected to and supportive of the child's focus and interest. The code includes 5 main codes, positive affect (PA), three subcodes within level 3 (High Synchrony), and types of socialization within Level 5. Each five-second interval is given one of the five main codes (labeled 1 to 5 below) according to the rules outlined in this document. In addition, Positive Affect is always coded. Whenever a 5-second interval includes positive affect, it is noted within that interval. Furthermore, it is always noted whether the positive affect is facial-laugher only, verbal content only, or verbal content and facial/laughter together. Furthermore, when an interval is considered High Synchrony (Level 3), the presence of feeling verbalizations (FVs) and two types of contingent verbalizations (CVs) are noted. Finally, when Restrict/socialize is coded, what type is noted. All other specific codes noted below are used only to determine which of the five main codes an interval falls into and are not themselves distinguished as individual codes (e.g., Child Interest, Different Focus, Just Watching).

This then is the structure of the Revised Synchrony Subcode.

1 Asynchronous/detached
2 Low Synchrony
3 High Synchrony
   a. CV(v): Contingent Verbalization in response to child's verbalization.
   b. CV(n): Contingent Verbalization in response to child's nonverbal behavior.
   c. FV: Feeling Verbalizations
4 Mother Observing
5 Restrict/socialize
   (a) Forbidden Toy (FT): Any interaction in which the FTs are at issue.
   (b) Clean (C): Keeping things clean in general (but sand stuff has its own code)
   (c) Break (B): Keeping things from breaking
   (d) Noise (N)/Rambunctiousness: Keeping noise and activity at reasonable level
   (e) Adult Things (AT): Not touching adult things (e.g., videotapes, too many tissues)
   (f) Safety (Sf): Ensuring that safety is maintained
   (g) Sand (S): Keeping sand off floor, table, child, mother, etc.
   (h) Spill water (W): Keeping pitcher, cups, and water under control

PA: One of three Positive Affect codes are used wherever positive affect occurs within any of the above five codes.

   a. F: Facial/Laughter Only
   b. V: Verbal Only
   c. V+F: Verbal plus Facial/Laughter.

Primary Codes

I. Level 1: Asynchronous/detached. Contains maternal actions that imply little connection between the mother's behavior and the child's immediate interests, feelings, or behavior.

(a) General (G). Failing to Respond (FR). When a child gives verbal or nonverbal signals such that a response should be forthcoming from the mother but is not. Grooming: Grooming the child is always considered distracting. In general mothers will not be coded "1" during interval in which they are looking at child.

(b) Different Focus (DF, Full Parallel). Mother is focused on a different activity, playing a different game, or fully focused on something other than what the child is focused on. She has not retained involvement with the child. Brief, insignificant attentional asynchronies of this kind are ignored. To be Level 1 parallel focus and activity should involve almost no looking at child, touching child or child's activity, or connection (for example, no verbalizations) between mother and child. Child looking at the mother is not considered a connection.

M1: Move, Level 1. When the mother moves objects that the child is not playing with and in so doing disengages completely from interacting with the child.

(c) Distracting (DS). Maternal behavior that relates to things that the child is not attending to (i.e., changing or trying to change the child's focus of attention). For this code to apply the child must have established a focus of attention that differs from the mothers'.

Mother Asking about a toy or activity is Level 1 if the child is fully attending to a different toy or activity when the question is asked

(d) Recrimination (RE). Criticizing; threatening, condemning, arguing, putting the child down.

(e) Resistance, Constraint, & Interference (RCI). Maternal behavior that resists, attempts to change, or interferes with the child's behavior.

Resisting. Child takes or tries to take a toy or object and mother resists. Mother must move toy away from interested child or pull against a child who is touching the toy and resisting.
Mother Takes a toy the child is interested in.
Physical Constraint. This is coded "1" unless it is sensitive helping or participation.

Interference. It is interference when mother take toys from children who are fully involved or interacting with those toys so that children must stop playing with them or so that children's play is disrupted, even if mothers are attempting to help when they do so.

II. Level 2: Low Synchrony. Contains behavior that suggests neither asynchronous/detached (Level 1) nor high synchrony (Level 3). Level 2 implies maternal behavior that is not highly synchronous but that is also not entirely disconnected.

(a) General. Code General Low Synchrony when an interval contains no acts that are High Synchrony or Asynchronous/detached: That is, no specific actions that must be coded High or Absence of Synchrony are present. Code General Low Synchrony for Late Speaking (LS), when mothers comment on something that the child is no longer attending to. This code is used only when the mother's timing is slightly off and she then quickly follows the child. Such brief timing lapses are not considered a different focus. If she has time to notice and change her attention, however, and still talks about a prior activity, it become Level 1 (DS or DF).

Code General Low Synchrony when, during interactions involving the same activity, the following occur:

(i) Talking about different part of same activity. Child is physically engaged in one part of an activity, and mother is talking about/engaged in different part of same activity (Partial different focus).
(ii) Child looking, but not behaviorally engaged in an activity the mother is showing (see Just Watching rule).
(iii) Child looking at one part of activity, mother talking about a different part of that activity (Partial different focus).
(iv) Mother's behavior changes child's attention from child's focus to mother's focus (Partial distraction).
(v) Maternal actions are not responses to the child's immediate words, attention, or actions even though they are focused on same activity. Mother and child are focused on the same activity but maternal behavior is not connected to child (they're not interacting) (Partial different focus).

(b) JW: Child just watching (mother usually showing or explaining). If the child is only watching and thus the mother is showing, explaining, questioning, or driving the interaction in other ways, code "2". If the child is talking about or is physically engaging an activity, then the mothers' words and actions about the activity are typically Child Interest.

Ignore trivial, partial, or secondary (child not attending) behaviors that do not constitute a focus nor a significant break in the child's watching. The child is still considered to be just watching.

Child Buys In. If a child who has been "just watching" begins to participate in a coordinated fashion with the mother (the child accepts the mothers "invitation"), the interaction becomes a "3", coordinated play.

Smiling. A "just-watching" child who smiles is still considered to be "just watching."

III. Level 3: High Synchrony. Contains maternal actions that demonstrate close connection between the mothers' attention and behavior and the child's immediate feelings and activity.

(a) General. Coordinated play, mutual participation **-** Talking about or nonverbally engaging with exactly what the child is touching, doing, attending to, etc. in a way that connects to the child's focus and interests (e.g., interacting with the child).

CNV: Contingent Nonverbal Behavior. Nonverbal maternal behavior that is contingent and matched well to the child's immediately prior verbal or nonverbal behavior (e.g., taking a toy offered by a child; picking up a toy at which the child points). Passive behavior (e.g., allowing the child to take a toy from your hand; watching a child cross the room) is not coded.

CI: Child's Interest. Commenting on the activity or play in which the child is currently interested. Commenting on what the child is touching or is focused on. Includes relating child's focus to a prior experience.

Comments or nonverbal behavior if the child is only watching during the interval are coded "2" (Child Watching). To be coded Child Interest requires that the child be engaging the activity, not simply focusing on it.

AT3: Ask about Toy Level 3. Asking child about a toy or activity if the child is watching plus talking or physically engaging the mother or the toy about which the mother is talking.

Child Buys In. If a child who has been just watching (just-watching child) begins to participate in a coordinated fashion with the mother (the child accepts the mothers invitation), the interaction becomes a "3", coordinated play.

HL: Helping & Instruction. Maternal behavior initiated to improve the child's immediate experience (e.g., stabilizing cylinder or train) unless intrusive or involves moving stuff (see Move rules).

M3: Move Level 3. Helping child by moving things. When the mother helps the child by moving objects that need to be moved for the benefit of the child or interaction. Exception: When during moving things to help the child, the mother separates from the child or takes on a different focus within the activity (M2).

US: Unfocused suggestions. Helping unfocused child by suggesting things. Suggestions to the child about what to do when the child is unfocused, not currently manipulating the toy, etc. To be considered unfocused, children should not be settled down with the mother. They need to have abandoned their prior focus and generally to be moving in search of an activity,

I: Instruction. Helping child engaging in an activity by giving them instructions and feedback. Mothers' instructing children who are clearly interested in a toy in how to engage the toy correctly or well, if this instruction is well-coordinated with the child's behavior. Labeling is not instruction (often it's Mother Showing).

Disruption Exception: Taking toys from children who are fully involved or interacting with them that children must stop playing or so that children's play is disrupted is interference, even if mothers were attempting to help (see Interference under Level 1).

(b) PA: Positive Affect, Praise, Affection, Empathy. Smiling, laughing, affectionate touch, and related positive affective nonverbal behavior. Praise, encouragement, affectionate remarks and related verbal behavior. The only exception to smiles being coded PA is when the mother is totally disengaged from the child, not even on the same activity, and not oriented toward the child.

(i). Facial/Laughter. Code PA as facial when it includes a smile and/or laughter.
(ii) Verbal. Code PA as verbal when it does not include a smile or laughter. Typically these will be positive remarks such as praise or encouragement that are not accompanied by facial/laughter expressions of positive affect.
(iii) Verbal+Facial. Code PA as Verbal+Facial (laughter) when both facial/laughter and verbal components are present.

Not Positive Affect. Surprise reactions are not positive affect. Thus, mothers who raise their eyebrows and open their mouths are not coded PA unless their surprise reactions includes a smile.

(c) FV: Feeling Verbalization. Questions or comments about the child's feelings. These include most "Do you like…" or "Do you want…" statement: "that hurt, didn't it?"; "that surprised you, didn't it?" "Do you like it?" "Did it scare you?" "Is it fun?" "Do you want to do something else?"

(d) TV: Thought Verbalization. Questions or comments about the child's thoughts and perceptions. These include open ended questions like, "What do you see in the box?"

Exceptions: "Do you know what this is", "Do you think it's a dog" are really the same as "What is this" and thus are not really asking about the child inner life. They appear to be inquiring about the child's thinking only semantically.

(e) CV: Contingent Verbalization. Maternal verbalizations that are a direct response to a child's prior verbal or nonverbal behavior and that appropriately address it (e.g., responses to fussing, crying, signaling). Repeat child. Repeating what the child has just said.

IV. Mother Observing. Watching the child but not acting or talking interactively. Mothers may change body positions, move to maintain attention, move to get out of the way, engage in self grooming, but she is not involved with the child and is watching only.

V. Restrict/socialize. Socialization verbalizations to the child designed to enforce or instruct about basic social norms and rules (e.g., verbalizations about keeping things clean, about playing with forbidden toys, Kleenex, or other objects, about not yelling, not breaking something, etc.). Nonverbal socialization constraint, such as constraining the child from touching the water pitcher or the forbidden toys. All interactions in which the forbidden toys, touching adult objects (staying away from candy jar, paper towels, etc.) and the like are at issue are coded "5" even if no verbalizations or other socialization behavior occurs. Code each socialization interval as 5 and specify which of the following types of socialization it was. (a) Forbidden Toy, (b) Keeping things clean in general (but sand stuff has its own code), (c) Keeping things from breaking, (d) Keeping noise and rambunctiousness at reasonable level, (e) Not touching adult things (e.g., videotapes, glasses, using too many tissues, etc.), (f) Safety, (g) Keeping sand off floor, table, child, mother, etc., (h) Spill water

VI. Not Codeable (NC). Any time the head/face of either mother or child is not within the screen, code NC. If the face/head is within the screen but obstructed, apply the normal code as written as best as you can. Also, any time the experimenter is in the room, the interval is Not Codeable.

General Rules for Application of Codes

When two codes occur within an interval. Often behavior from two clearly different levels is present within a single 5-second interval. When this occurs, coders should use the priority scheme below or, if no priority rules apply, should use the Default Code, Level 2.

Watching is irrelevant. Unless Watching occupies the entire 5-second period, ignore those parts of the 5 second interval in which the mother is only watching.

Code mothers' behavior. Focus coding on the mothers' behavior and its relation to the child's behavior even if the mothers' behavior is a response to a child's behavior from a prior interval.

Acts begin when the first movement can be detected (e.g., arm first moves, lips first move back to begin a smile). They are considered to be a part of the interval in which they begin.

Code discreet behaviors only in the interval in which they begin. Don't code the same act in two intervals. Single acts that extend across two intervals are coded only in the first interval. The part of them that extends into the next interval are ignored for determining the code of that next interval. However, if a sequence that contains multiple acts crosses an interval, consider the first act to be in the first interval and subsequent acts to be in the next interval when they begin in that next interval. In general, verbal behavior is a new act when a new sentence has begun or utterances are separated by a brief time interval. Nonverbal behavior is a new act when lack of fluidness implies two components.

Facial behavior is considered new when an accentuation or non-gradual change occurs. Smiles are coded only once. Face must return to no smile or clearly accentuate to be coded again. However, if a smile takes up the entire next interval, even if it is a continuation of a previously coded smile, the interval is coded PA or high synchrony.

Changing positions. Changes of position for comfort or simply to get out of the way are not coded.

Visual attention is primary. In general, a person's focus of attention is considered to be that at which he or she is looking (unless the mothers' verbalizations are totally unconnected to her visual attention, such as, "I should have bought groceries").

Ambiguous attention is synchronous. When it is unclear whether the mother is looking at the child or the child's activity, we assume that she is. By default ambiguous direction of attention is considered synchronous.

Passive behavior. Passive (non-)behavior from mothers is considered uninformative and is generally not coded. Children's taking things from a passive mother, for example, tells us little about the mother.

Moving objects is ignored if mothers maintain their ongoing involvement with the child in the process. On the other hand, if they disengage to move objects, it's considered a different focus ("1").

Referencing is looking away from ones partner or activity briefly and then looking right back again without establishing a new focus elsewhere. It is ignored and does not affect coding.

Subcoding: PA is always coded in any interval in which it occurs. CV(v), CV(n), FV are coded only within High Synchrony ("3") intervals. Other individual behaviors (e.g., df, ds, re, rci, jw, tv) are not coded but are only used to assign the interval to an appropriate 1 to 5 category. For restrict/socialize, specify what type occurred.

Priorities and Defaults

Priority 1: SOC: Restrict/socialize. When the socialization code applied, it has priority over all others.

Priority 2: RE Recrimination, criticism. Intervals that include RE are always Level 1.

Priority 3: PA Positive affect, praise, attention. Intervals that include PA (praise, contingent smiling, laughing, etc.) are Level 3 unless RE (recrimination) has also occurred.

Priority 4: Feeling verbalizations. Verbalizations about the child's feelings FVs are priority 3.

Priority 5: Contingent verbal and nonverbal behavior. Contingent verbal and nonverbal behavior – CVV, CNV, and CVA – are Priority 4.

Levels 1 and 3 Take Priority Over Level 2. An interval that contains interactions that are Level 3 or Level 1 should never be coded Level 2. Level 2 is uninformative relative to the more extreme behaviors reflected in the other codes. If any part of an interval is a 1 or 3, do not use code 2.

Level 1 Takes Priority Over Level 3. Level 1 is rare and Level 3 is common, Level 1 takes priority.

Ambiguous Intervals Default to Level 2. When it is unclear which code is best, use Level 2.

Appendix B: Maternal Autonomy Granting Code

The Maternal Autonomy Granting Code measures how parents influence their children, with an emphasis on moments when parents' and children's goals conflict.

I. Which Segments Are Coded

A. Interactions That Are Coded

Segments are coded either (a) if the mother attempts to influence the child at moments when the two have conflicting goals or (b) if particular events (i.e., difficult activities) occur that commonly involve conflicting goals and maternal influence. All statements and behaviors related to either of these interactions are coded.

1. Conflicting Goals

Behavior is coded when mothers try to influence children in ways that implies that mothers' and children's wants are in conflict or do not correspond. In these instances mothers must be trying to get the child to do something or to refrain from doing something. This occurs most often when mothers want children to be safer, cleaner, gentler or more careful; or to act "better."

Socializing or enforcing rules of proper conduct. Even if the child is not resistant to conforming to rules of proper conduct, such rules are considered to be important primarily to the parent and not to the child. Thus, they are always coded.

"say please"
"sit up straight"
"keep sand in the sand box"
"don't put your fingers in your mouth"

Distraction. Mothers are attempting to get the child's attention away from a forbidden toy, object, activity, etc.

Touching "off limits" Stuff. Trying to get the child to avoid touching objects such as the water pitcher, paper towels, forbidden toys, candy, Kleenex, the VCR, or videotapes.

Safety: Getting the child to play safely (e.g., "be careful" or "be gentle").

Annoyance: When mothers are delivering commands as a result of annoyance, the commands are coded because annoyance implies that goals are in conflict.

2. Difficult Activities

Behavior is coded when interactions concern events that commonly involve differences in goals and attempts to influence children, even if during such events goal-related differences or influence attempts are not apparent. Thus, behavior in these interactions is coded even when children are cooperating and no goal conflict is apparent. These events are:

(a) forbidden toys
(b) cleaning up toys
(c) spilling sand or water
(d) touching off-limit objects, that is, the candy jar, videotapes, paper towels, or Kleenex.
(e) child leaving the room

Mother's Focus. The mother must be dealing with the child during these difficult activities (i.e., mother's speech must be directed towards the child). Mother's speech that is not directed toward her child (i.e., she is talking to herself) is not coded.

B. Interactions That Are Not Coded as Influence (i.e., Coded as Catch-all Statements)

Behavior is not coded during play interactions or when mothers seek to help children get children what they want (i.e., comforting them, reaching to get things for them, asking them to move so that the mother can help them, etc.).

During Play. Play-related behavior is not coded unless other non-play issues arise during play (e.g., safety, cleanliness, cleanup, or "off limit" stuff). Neither suggestions nor influence attempts during play are coded. Suggesting new toys, different toys, or other means of controlling play are not coded.

When Goals Are Compatible. Unless an interaction involves a predesignated "difficult activity," behavior is not coded when mothers and children have compatible goals. If mothers appear to be functioning to help children get what children want, maternal behavior is not coded.

Sympathizing statements are not coded unless they occur as part of an interaction that involves influence or difficult activities.

Grooming. The mother grooming her child (e.g., tying the child's shoes or tucking the child's shirt in) is not coded unless clear goal conflict emerges

during the interaction (i.e., she continues after the child shows disapproval or resists).

Uncodeable Segments. Behavior is not coded if either the mother or child is out of the camera frame (particularly the face) or an experimenter is in the room. If any part of a coding segment is uncodeable, the entire segments as given a (NC).

Either the mother or the child is off-camera. Both of them must be on camera. Stop coding at the moment either the mother or the child (particularly their face) is off-camera and resume coding at the moment both are on camera.

If experimenter is in room. The experimenter must not be in the room. Stop coding at the moment the experimenter is in the room and resume coding at the moment the experimenter leaves.

II. How to Segment

Segmenting verbal behavior. Verbal behavior is segmented into sentences. Code each individual sentence as a separate act. Mother's speech is coded from the first sound that is a part of her sentence. A sentence is determined by how the mothers' speech would be punctuated in standard English. Although they can be abbreviated, sentences typically have a subject and verb, with accompanying subordinate material. Often, but not always, a brief pause occurs before the next sentence. Sentences typically contain coherent or related meaning. Some common segmenting issues involve:

Pauses. Pauses are not segmented as new sentences if it appears that there is a thought completion after the pause.

Conjunctions. The words "and", "but", and other conjunctions that connect multiple phrases indicate that a single sentence is present.

Introductory material. Sentences often begin with the child's name or other introductory words or short phases, such as "look," "here," "okay," or "by the way." When this is the case, the behavioral unit begins with the introductory word even if there is a significant pause between such words and the rest of the sentence. Thus, the introductory word or phrase is coded as part of the complete sentence that follows it.

Faltering start rule. A faltering start (e.g., "its time to…do you want to clean up?") gets coded as part of the statement that follows it, if the two statements are clearly related.

Speech After the sentence. Once a sentence is linguistically complete (i.e., subject/verb), subsequent speech will tend to be coded as a new sentence unless it consists clearly of subordinate clauses, prepositional phrases, or other material connected to the main clause.

Short repetitive rule. Single words (e.g., "no", "nope", or "don't") or phrases ("don't do that, don't do that") that are repeated in close succession are segmented as a single sentences.

Repetitive statements as separate codes. Repeated phrases are coded separately if they are sentences that individually, would receive different codes (e.g, "lets put the train away; put the train way). "Lets put the train away" would be coded as a *child-friendly command*, and "put the train away" would be coded as a *direct command*.

Single word rule: Single words or the child's name typically aren't a sentence unless a major pause or change implies a new thought.

III. Autonomy Granting

At the heart of autonomy granting is altering children's motivation. In essence, autonomy granting is an attempt to change the child from one motivated to undermine what parents seek to one motivated to promote it. To accomplish this, parents can use any number of techniques. Autonomy granting can occur prior to a command. When this occurs, it is still coded as autonomy granting.

1. Sequencing (AS). Sequencing increases children's motivation to promote parents' plans by arranging for incompatible concerns to be attained sequentially, that is, for mothers' concerns to take priority immediately and for children's concerns to be met next. Sequencing statements let children know that, *although children's interests will not be met now, they will be met soon.* Usually such statements state or imply that something desired by the child will happen "later" or "soon." Examples of sequencing statements include:

"We may be may be able to play with that toy later"
"Pam (the experimenter) is going to bring us some toys"
"We can play later"
"You are going to get to play"

Implied Sequencing. Maternal statements are coded as sequencing if they <u>imply</u> that the child's concerns will soon be met.

"Just a minute"
"Wait a second"

"Hold on a second"
"In a little bit"

Child's need satisfied first. When the child is the first recipient of sequencing, the influencing strategy is not sequencing. An example statement:

"Alright, you can play with pen, but mommy is going to need it back in a minute"

2. Adapting (AA). Adapting is when parents add to or subtract from a course of action so that the child's interests are better addressed. When adapting, parents *make it fun, do it in a way that is responsive to children's interests, or figure out how to handle parents' issues so that the child's can be promoted.*

Making It Fun. Mother adjusts events in such a way that she makes a game out of it or in some other way makes it more interesting to the child. For example, in attempt to get her child interested in complying, the mother may sing "the cleanup song" or state, "tell the toys bye-bye."

Mother's tone of voice. Mothers who simply speak in a child-friendly way are not coded here as "making it fun." This code is not for minor changes in tones of voice. Rather, it is coded as adapting only when the mother is singing, making a game out it, or using such extended and exaggerated tones of voice over time that it implies a game-like approach.

Child-friendly Adapting vs. Child-friendly Commands. Do not code it as *Adapting* simply when mothers attach nice but relatively superficial words to their statements, such as "honey", "sweetie", or "please." Commands that contain such words are *child-friendly commands,* not *adapting*.

Ensuring That It's Done Acceptably. Acting so that the child gets what he/she wants but in a way that handles a mother's concern is *adapting* as long as she does so without lessening her expectations (i.e., which would be compromising). Example statements of this are:

"Can momma pour?"
"How about if mommy pours?"
"Let's move you closer so that you won't spill that on the floor"

Adapting vs. Compromising. Although similar to compromising, adapting does not involve give and take or parental sacrifice. Rather, adapting simply adds actions to a parent's plan that enable children's interests to be incorporated.

3. Justifying, Convincing, Reasoning, or Explaining (AJ). Justifying occurs when parents *explain the value of, or in other ways, justify* the parents' or child's course of action in a way that would seem to motivate the child to comply.

Benefit to mother. Urging the child to cooperate with or comply because it will benefit the mother is *justifying* if the mothers phrases her statement with a "because" or "for" clause. Statement that imply helping the mother are not coded as *justifying* if they could be interpreted simply as a "we-command" (i.e., we need to clean up). For example,

> *"Don't you want to do that for Mommy?"* is *justifying* because of the "for" statement.
>
> *"Help me clean this up"* is not *justifying* because there is no "for" or "because" statement. The statement thus is comparable to "Let's clean up."

Benefit or lack of benefit to the child. Pointing out to the child that expected behavior will benefit them – such as make them proud – or pointing out that what the child wants to do will not benefit child.

> *"Can you show mommy you are a big girl by cleaning this up?"*
> *"Can you be a good boy and put that toy away?"*

Benefit to someone else - It is *justifying* when the mother explains the benefit, or lack of benefit, of a child's course of action for somebody else (e.g., another child or the experimenter). Typically the other who is benefited is the experimenter. Examples of these statements include:

> *"Lets pick up the toys for the lady"*
> *"Those are somebody else's toys"*
> *"Those aren't yours"*
> *"They don't want us to play with those"*

Material benefit. It is *justifying* when mothers explain the possible negative effects of a behavior on some object or state of affairs.

> *"You are going to get the chair wet"*
> *"That is going to spill"*
> *"The toy might break"*

Justifying vs. Adapting. Unlike *adapting,* which is about promoting cooperative exchanges by the mother changing her behavior, justifying promotes cooperative

exchanges by having mothers use reasoning and explanation to convince the child to comply.

Time to leave rule. The mother states to her child "it is time to go bye-bye" or "we have to go bye-bye". Their immanent departure is seen as a justification to try to get the child to do something (e.g., to clean up). However, if the mother is using the phrase "bye-bye" as a child-friendly synonym that makes a game out of putting a toy away, it's *adapting*.

4. Compromising (AC). Compromising changes children's motivation by negotiating a way that both parent and child can achieve part of what they want if each relinquishes another part Compromising involves *lightening or reducing the demand on the child* while maintaining some demand. An example of a compromising statement:

> *"Ok, you don't have to put both blocks away but what about putting 1 block, in here"*

Compromising vs. Distracting. Pointing out alternative toys to reduce or eliminate play with a particular toy is not compromising, but replacing/distracting.

Placing limits on activity. Permitting some engagement with an activity but less than the child wants is compromising. For example, during a paper towel or Kleenex conflict. It is compromising if the mother tells her child that "she can just have one".

5. Motivational/Internal State Questions (AM). These are questions about children's motivations, internal processes, knowledge, abilities, or preferences in the context of influence or difficult activities. It is a *motivational question* when

> (a) Motivation: the mother asks about the child's motivation – what he/she wants to do – without implying that she wants a particular behavior from the child. Generally these statements should be seen as expressions of interest in the child's motivation or feelings rather than simply ways of getting the child to perform a specific act. An example this type of question could include: This code is used only when questions about children's motivation occur during influence or difficult activities. In and of themselves they are not coded.
>
> *"What do you want to do?"*
> *"Do you want some water?"*

(b) Other Internal States: the mother asks about the child's ability, perspective, state, preference, or opinion. Asking about what the child knows, is able to do, or prefers in the influence situation or difficult activity. Examples of these types of motivational questions include:

"Is that too heavy for you?"
"Are you ready to clean up?"

III. Other Significant Behavior

Other significant behaviors are only coded if they occur during an influence situation or a "difficult activity." Unless related to such codeable situations, these behaviors are not coded.

1. Expressing Praise or Reinforcement after the action (OR). Mothers display approval for children's previous action. Examples of reinforcement can include:

"*Thank you for cleaning up"*
"There you go"
"Good job"
"That'a boy"

2. Catch-all category (OA). Any verbal statements related to an influencing attempt or "difficult activity" that does not fall into another category.

Modeling. Mothers demonstrate how to do a task are not coded unless it is part of an influence interaction or difficult activity. When it is coded, it is simply "catch-all" behavior.

Informational statements. When mothers issue statements, instructions, or information about how to execute a command, or how things work. For example:

"Everything is going to go in here"
"Here is a paper towel"

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